

SVETLANA ZECEVIC

Meaning and Modality by Carnap and Kripke

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I

Meaning/Naming and Modality: What defines what?

The Main Objectives

In accordance to the title of this work it is obvious that the key concepts are meaning (naming) and modality, their connection and relationship. Meaning and naming are concepts usually regarded in semantic, linguistic and philosophy of language, and modality (necessity) is a basic concept of modal logic. So, it is accepted that meaning and naming generally belong to semantic and philosophy of language, while modalities belong to metaphysics since they are about the essential (in the case of necessity, of course) properties of things. This fact leads to semantics and modal logic, but since it is to wide area we will focus on two leading philosophers known for their great contributions to this issue: to eminent member of *Vienna Circle* Rudolf Carnap, and great contemporary logician Saul Aron Kripke. First step in this comprehensive analysis is to represent both Carnap and Kripke's philosophy/logic relevant to meaning-modality issue. The aim of our analysis is not just to define these basic concepts but to investigate how they are connected to each other and which of them can serve as ground for defining the others. It is interesting to deal with question about the *aprioricity* regarding these concepts, asking ourselves could we determine which one has to be *definiens* and which one *definiendum/ analysans* or *analysandum*, or is it works in both ways. To answer this and other relevant questions it is necessary to set certain boundaries, and this is the reason why our approach is taken through two semantic and logical (philosophical) systems. The first system represents a study in semantics and modal logic, where the method of semantic analysis is developed and has to serve as a ground for further analysis of modality, and here we refer to Rudolf Carnap and his semantics and modal logic. The second system is a study of modal logic and corresponding semantic concepts, where basic modal concepts are defined (necessity, analyticity and *aprioricity*) aimed to define basic semantic relation (naming relation), and here we refer to Saul Kripke. These two systems represent two possible ways of analysis: we can start with semantics and its basic concepts to define modality, or with notions of modal logic and try to define basic semantics concepts. But this is not something that could be taken as contradictory. Both ways provide a wider insight in this issue, and our main task is to determine the *particular frameworks* already existed in both Carnap and Kripke's system and to compare them in order to get insight in their main thesis and

arguments provided in favor to those theses. Summing up, *the main objectives* of this work are:

1. to represent relevant theses for both Carnap and Kripke's *semantics and their modal logic* in order to provide a proper base for the comparative analysis,
2. to determine the main *questions and answers they take to be the fundamental* for this issue,
3. to determine *particular frameworks* as a starting point and boundaries that frame their basic theses,
4. to find out *whether given solutions are acceptable or not*, and which account represents the adequate solution to all fundamental questions they dealt with.

This comprehensive comparative analysis includes extended overview of relevant theses of both Carnap and Kripke's semantics and modal logic. Representing Carnap's system we put accent on the following points:

- the main theses of his *logical syntax* such as linguistics framework, the principle of verification, metalogic, the rules and modes of speech,
- the main theses about *the method of extension and intension*, extensional and intensional context, the principle of interchangeability and the belief sentences,
- the main theses regarding *the method of the name-relation* and its principles,
- the main theses of his *modal logic*: the object language – metalanguage distinction, modal semantics, formation and transformation of modal sentences.

Representing Kripke's system we put accent on the following points:

- the main theses of his *modal logic*, especially his *possible worlds semantics*,
- the main theses of his *semantics and causal theory of proper names*, rigid and nonrigid designators, speaker and semantic reference
- the main theses regarding the puzzle about belief and the *belief sentences*.

After the overview of both systems we continue with comparative analysis explaining Carnap and Kripke's semantics from the point of view of classical and neoclassical theories, stressing their main features. The comparison proceeds through the three main points: meaning and modality, name relation, and the belief sentences, and given analysis is to be taken as the fundament for listing the main questions, and determining and distinguishing the *particular frameworks* already included in both Carnap and Kripke's semantics and modal logic. The final conclusion represents the explanation of these particular frameworks that characterize their different approach to the same issue: *meaning and modality*, confirmed by

the titles of their capital works dedicated to these concepts, Carnap's „*Meaning and Necessity*“, and Kripke's „*Naming and Necessity*“.

II

Rudolf Carnap: Meaning and Necessity

1. Logical Syntax

1.1. *Abstract Entities and Linguistic Frameworks*

Before starting with *logical syntax* as an analysis of scientific language it is needful to explain what Carnap understands by *logical analysis of science*. The analysis of science starts with various approaches, and its subject matter is carried out by science itself, and every branch of science analyzes its subject matter. But, by *analysis of science* (or theory of science) Carnap meant an investigation that differs from the branch of science to which it is applied. If we want to study the scientific activity we can deal with history or methodology of science: here subject matter is science as a body of actions carried out by certain persons under certain circumstances. But, in this context Carnap is much more interested in the analysis of science in another sense: he is interested not in the actions of scientists but rather in their *results* (that is, in science as a body of ordered knowledge). The results are certain linguistic expressions (statements asserted by scientist), not beliefs, images or behavior influenced by scientists. So, the task of the analysis of science in Carnapian sense will be to analyze such statements, the types of such statements, relations existing between them, their structures, and theories as ordered systems of those statements. Carnap points out that it is possible *to abstract an analysis of statements of science* from the persons asserting the statements, psychological and sociological conditions of such assertions. The analysis of the linguistic expressions of science under such an abstraction is what he calls ***logic of science***, and here he distinguishes two main parts. The first part is investigation restricted to the *forms of the linguistics expressions* (the way in which linguistics expressions are constructed out of elementary parts without referring to anything outside of language). The second part is the investigation that goes beyond this boundary and studies linguistic expressions in their relation to the object outside of language. In the first part Carnap deals *formal study* and the field of such formal studies he calls *formal logic* or *logical syntax* (*formal or syntactical analysis of language of science*). In the second part the given language and its expressions are analyzed in different way, this investigation is not restricted to formal analysis but consider an important relation between linguistic expressions and other object: relation of *designation*, and the investigation of this kind is called *semantics*.

So, it is possible to distinguish logic of science in the narrower sense (syntax) from logic of science in its wider sense, comprehending both syntax and semantics. Carnap is mainly interested in syntax or syntactical analysis of language of science. The word 'science' he uses in its widest sense, including in it all theoretical knowledge. The term 'language of science' refers to language that contains all statements, or theoretical sentences as distinguished from emotional expressions. The necessary distinction is between *formal* and *empirical sciences*, and for Carnap, formal science consists of analytic statements established by logic and mathematics, while empirical science consists of synthetic statements established in different fields of factual knowledge.

Speech about these distinctions leads to the discussion about '*abstract entity*', usually taken as an object lacking spatial-temporal properties, but supposed to have being, to exist or to subsist. *Abstracta* could be collected under the category of universals and it includes mathematical objects, geometrical figures, propositions, properties and relations. Abstract entities are abstracted from particulars, and we say that the *abstract triangle* has properties common to all triangles, and none peculiar to any particular triangles: it has no definite color, size, or specific type. Properties and relations are needed to account the resemblances among particulars (such as redness shared by all red things), while propositions (as abstract contents, meanings of thoughts, or expressions of thought) are sometimes said to be necessary to explain translation between languages, and other semantic properties and relations. Many philosophers still believe that *abstracta* are indispensable in metaphysics, and the main philosophical question is that of the existence of abstract entities. Affirmative answer to this question is given by *realism* by pointing out that much of the talk and thought concerns concrete objects, but significant parts of it appear to be about objects which lie outside space and time. *Nominalists* are aimed to eliminate all apparent reference to and quantification over abstract objects, and *empiricism* stresses the fundamental role of experience, as a *doctrine in epistemology* it holds that all knowledge is based on experience, and as *empirical theory of meaning* holds that the meaning of words/concepts are derivative from experience. But, it's not easy to give a clear analysis of 'experience': it includes any mode of consciousness in which something seems to be presented to the subject, as contrasted with the mental activity of thinking about things. So, experience has different modes (sensory, aesthetic, moral, religious), but empiricists usually concentrate on *sense-experience*. We know that not all knowledge stems directly from experience, and hence empiricism assumes a stratified form in which the lowest level is directly from experience, and higher levels are based on lower levels (the lowest level simply read off what is presented in experience). As been acquainted with the history of philosophy

we know that different philosophers pick out the different phenomena with the word 'experience', and even when they pick out the same phenomenon they have different views about the structure of experience. *Empiricists* are suspicious to any kind of abstract entities (properties, classes, relations, numbers, propositions, etc), feeling more sympathy for nominalists than realists. They try to avoid any reference to abstract entities and restrict them to *nominalist language*, language that does not contain such references. But, in certain scientific contexts it is hard and even impossible to avoid them, mathematics for example.

In the last few decades the problem of abstract entities arises in connection with *semantics* (the theory of meaning and truth), and Carnap was interested in this topic since according to him the important step in the development of language analysis consists in the supplementation of syntax by semantics. He realized that there must be a mode, different from the syntactical one, in which we can speak about language. Since it is possible to speak about facts and about expressions of language, it cannot be impossible to do both in the same meta-language. It becomes possible to speak about relations between language and facts, and in the new meta-language of semantics it should be possible to make statements about the relation of designation and about the truth. What is important, according to Carnap, is to clarify the nature and implications of accepting the language referring to abstract entities. It is necessary to recognize the fundamental distinction between two kinds of questions concerning the problem of existence or reality of entities:

1. the question of existence of certain entities of new kind within the linguistics framework – if we want to speak in our language about a new kind of entities we have to introduce a system of new ways of speaking, subjected to new rules as well (this procedure is known as the construction of *linguistics framework* for the new entities in question); this type of question is known as *internal questions*;
2. the question of existence/reality of the system of entities as a whole, and this type of question is known as *external questions*.

Internal questions and possible answers to them are formulated with the help of the new forms of expressions, and they may be found either by purely logical methods or empirical methods, depending upon whether the framework is logical or factual. Carnap clarifies this problem in the context of analysis of various kinds of expressions, examining them from the point of view of the method of verification. He shows that the concept of reality presented in internal questions is an empirical, scientific, non-metaphysical concept. To recognize something as a real thing, or event, means to succeed to incorporate it to the system of things, at a particular space-time position so that it fits together with the other things recognized as

real, according to the rules of the framework. In fact, ontological questions about the entities can properly be raised as internal questions. Once we have accepted the thing-language, and thereby the framework of things, we can raise and answer internal questions. On the contrary, *external questions* are the questions of the reality of the thing world itself, and they can be raised only by philosophers. Carnap notes that this is the kind of question metaphysicians take themselves to be addressing, but argues they cannot be solved because they are framed in wrong way. What we can do is to make the choice whether or not to accept and use the forms of expression for the framework in question. Why is it so? To be real in scientific sense means to be an element of the framework (this cannot meaningfully be applied to the framework itself). The thesis of the reality of the thing world cannot be formulated in the thing language or in any other theoretical language. Also, it is important to clarify that the acceptance of linguistic framework must not be regarded as implying any metaphysical doctrine concerning the reality of the entities in question.

1.2. The Different Kinds of Expressions and the Principle of Verifiability

During the time while he was writing his „Der logische Aufbau der Welt“ Carnap arrived at neutral attitude with respect to the language forms used by various philosophical schools. He was interesting in *phenomenalistic language* about sense data, and *realistic language* about perceptible things and events. He regarded *phenomenalistic language* as the best language for philosophical analysis of knowledge, believed that the task of philosophy consists in reducing all knowledge to a basis of certainty. If it is accepted that the most certain knowledge is that of immediately given, as opposite to knowledge of material things, it seemed that philosopher must use a language that has sense data as its base. He changed his attitude toward a preference for the *physicalistic language*, and one of its most important advantages is *intersubjectivity* (events described in this language are in principle observable by all language users). Carnap's neutral attitude did not mean that he regarded these differences between various language forms as unimportant. On the contrary, in his opinion one of the most important tasks of philosophers is to investigate these various language forms and their properties. But, this kind of investigation must be applied to artificially constructed symbolic languages and the investigation of ordinary world language may be useful only as a certain kind of preparation for the more exact work on artificial language systems. It is interesting that precisely this neutral attitude led Carnap to adopt the *principle of tolerance* in his well known *Logical Syntax*.

Of the special importance is Carnap's view of metaphysics, where he tried to compare metaphysical kind of argumentation with investigations in empirical science, especially in the logical analysis of language. The problem was in the neglect to make distinction between logical types of various kinds of concepts, and in inconclusive nature of metaphysical arguments. But, the most decisive development in Carnap's view of metaphysics occurred later in the Vienna period, when he has agreed with Wittgenstein adopting a similar view that many theses of traditional metaphysics are useless and devoid of cognitive content. According to this view they are pseudo-sentences and they just seem to make certain assertions because they have the grammatical form of declarative sentences. In fact, such theses do not make any assertions and do not express any propositions, and the conclusion was that all those propositions that claim to represent knowledge about something that is over or beyond all experience are *metaphysical* propositions/theses¹. So, metaphysical theses are neither true nor false and the apparent questions to which these theses give either an affirmative or negative answer are pseudo-questions. The view that these theses and questions are non-cognitive was based on the *principle of verifiability*². In general, the principle of verifiability means that the meaning of sentence is given by the conditions of its verification and sentence is meaningful iff it is in principle verifiable (if there are possible circumstances which, if they did occur, would definitely establish the truth of the sentence). At the first time Carnap accepted this version of the principle of verifiability, but later this principle was replaced by the *principle of confirmability*. He has modified the verifiability criterion of meaning to confirmability condition, where terms can be introduced into meaningful scientific discourse.

Within the context of verifiability Carnap makes distinction between three kinds of philosophical problems and doctrines that he calls *Metaphysics*, *Psychology*, and *Logic*. He was mainly interested in the last one but combined with other two. He explained the main features of the method of philosophy used by philosophers of *Vienna Circle*, and the method in question was the *method of logical analysis of science*, or *the method of the syntactical*

¹ The view that metaphysical propositions have no sense, (they don't concern any facts) is already expressed by Hume, in his „Enquiry Concerning Human Understanding“. It seems to him that the only objects of the abstract sciences or demonstration are objects such as quantity, number and alike. All other sciences and enquires regard only matter of fact and existence, and these are evidently incapable of such demonstration. Now, if we translate this into terminology of *logical positivism*, we come to the position that only the propositions of mathematics and empirical sciences have sense, and that all other propositions are without sense. So, it is not so surprising that Carnap, as well as the members of Circle, were agreed with Hume's view. His philosophy has been considered as leading neo-sceptic philosophy of the early modern period.

² Wittgenstein has developed most radically the view that propositions of metaphysics are shown by logical analysis to be without sense. The problem that arises is that in that case his own propositions are also without sense, which he accepted and pointed out that the result of philosophy is not a number of philosophical propositions, but to make propositions clear.

analysis of scientific language. The members of the Circle came to the conclusion that it is possible to speak about language and about the structures of linguistic expressions, and on this base Carnap develops his idea of logical syntax as the purely analytic theory of the structure of its expressions. His thinking was influenced by investigations of Hilbert³, Tarski⁴, and Gödel⁵. He has emphasized that the purpose of logical analysis is to analyze all knowledge and all scientific assertions, as well as those of everyday life, in order to make clear the sense of each such assertion and connection between them. This means that one of the principal tasks of the logical analysis of given sentence is to find out the *method of verification* for that sentence. The *method of verification is a claim about what meaningfulness really is*. The fact that sentence is *meaningful* provide that there is a method for verifying it, meaning that if a sentence has no such method, then it is *meaningless*. In other words, *the purpose for which this verification principle was originally introduced* was to demarcate sentences that are apt to make significant statements of fact from pseudo statements/sentences. The main questions are „What reasons can there be to assert this proposition?“ or „How

³ Hilbert's program as a proposal in the foundations of mathematic was first formulated in the 1920s, and its aim was to justify classical mathematics. That justification presupposed a division of classical mathematics in two parts: real mathematic – to be regulated, and ideal mathematic – serving as regulator. Real mathematic was taken to consist of the meaningful, true propositions of mathematics and their justifying proofs. These proofs are commonly known as finite proofs and they were taken to be of an especially elementary epistemic character. On the other hand, ideal mathematics was taken to consist of sentences that do not express genuine propositions, and derivations that do not constitute genuine proofs of justifications. Classical logic is regarded as the preferred logic of human thinking – the logic of the optimally functioning human epistemic engine, the logic according to which the human mind most naturally and efficiently conducts its inferential affairs. In: *Concise Routledge Encyclopedia of Philosophy* (p. 352-53) and *The Cambridge Dictionary of Philosophy* (p. 381-83).

⁴ Alfred Tarski also had a great influence on Carnap's philosophy, especially in the field of formal, or logical, analysis of language. What we have in mind here is his *definition of truth*, which is unlike to those of other philosophers. He actually did not provide a general definition of truth, but instead he offered a method of constructing, for a range of formalized language L, the definition of the notion „true sentence of L“. In other words, a main feature of his method of constructing lays down in his „criterion T“, as a *condition* that any definition of true sentence of L must satisfy. This insight has become a *fundament of modern analytic philosophy*, reducing *philosophical problem of defining the truth* to *logical problem of constructing a single sentence* having the form of definition. Tarski *reduced the modal notion of logical necessity to a combination of syntactic and semantic concepts*, and avoid reference to modalities and „possible worlds“. In: *Concise Routledge Encyclopedia of Philosophy* (p. 875-76) and *The Cambridge Dictionary of Philosophy* (p. 902).

⁵ Gödel and his method of arithmetization had a great influence on Carnap's way of thinking, especially concerning the *formal method in syntactical analysis of language*. The most important is Gödel's understanding and solution of foundational and methodological problems, so-called „completeness problem“. Applied to a proposed system for *first-order quantificational logic*, the *completeness problem* is the problem of whether all logically valid formulas are provable in it. In his doctoral dissertation he gave a positive solution of the completeness problem for a system of quantificational logic, and this is the first of his famous three theorems. The other two theorems arose from his investigation of the completeness problem for *more comprehensive formal systems*, systems comprehensive enough to encompass all known methods of mathematical proof. In the first incompleteness theorem what cannot be proved is a true sentence of the language of the given theory. In second incompleteness theorem what cannot be proved is a sentence of the theory that expresses its consistency. Carnap finds these two theorems interesting, especially regarding the possibility that his formal theory of expressions could be formulated by means of Gödel's method of arithmetization. In: *Concise Routledge Encyclopedia of Philosophy* (p. 318-19) and *The Cambridge Dictionary of Philosophy* (p. 347-49).

can we become certain as to its truth or falsehood?”⁶ These questions are *epistemological questions*, and epistemology as the philosophical theory of knowledge is taken to be a special part of logical analysis.

Speaking of verification, it is important to make distinction between two kinds of verifications: *direct*⁷ and *indirect*⁸ verification. Proposition which assert something about present perception can be tested directly by our present perception, for example by seeing something, and this is the case of *direct verification*. In the case of *indirect verification* we deal with proposition that is not directly verifiable, say proposition P, and can only be verified by direct verification of propositions deduced from the P together with other already verified propositions. But, the number of instances deducible from P, on the ground of other propositions already verified or directly verifiable is infinite. Thus, it is always possible to find out a negative instance, however small its possibility may be. So, Carnap concludes that proposition P can never be completely verified and that we may come only to a *degree of certainty* that can be sufficient for all practical purposes, and that absolute certainty can never be attained. This kind of unverifiable proposition he called *hypothesis*. He emphasizes that every assertion of science has this character to assert something about present experiences, and therefore it can be verifiable by them, or to assert something about future experiences, and therefore it can be verifiable only by other already verified propositions.

His special interest was to exam the **metaphysical kind of proposition**⁹ from the point of view of verifiability. It is easy to realize that such propositions are not verifiable: from the proposition „The Principle of the world is Water“ it is not possible to deduce any proposition asserting any experiences which may be expected for the future. Therefore, this kind of proposition asserts nothing at all. Since metaphysicians cannot avoid making their propositions non-verifiable, the decision about the truth/falsehood of their doctrines would depend upon experience, which means that their doctrines therefore belong to empirical science. This is a consequence that they want to avoid because they pretend to teach knowledge of higher level than that of empirical science. So, they are compelled to cut all connection between their propositions and experience, and precisely in this way, and by this procedure, they deprive them of any sense.

⁶ Rudolf Carnap, *Philosophy and Logical Syntax*, London: Kegan Paul, Trench, Trubner &Co. Ltd., Broadway House Carter Lane E. C., 1935, p. 10.

⁷ Ibid.

⁸ Ibid., p. 11.

⁹ Ibid., p. 15.

The same analysis has been applied to **philosophical doctrines** usually called epistemological¹⁰ (realism, idealism, solipsism and positivism). Taken in their traditional form all these doctrines *assert* or *deny the reality of something*. The main question is about the sense of this kind of assertions. Assertions about reality and unreality do occur in empirical science, they are examined in empirical way and therefore they have sense. But, Carnap emphasizes that it is necessary to make distinction between *two concepts of reality*, one occurring in *empirical* and other in *philosophical propositions*. If we accept that reality of anything is just possibility of its being placed in certain system, in space-time system of physical world, than the question about reality of anything has sense only if it concerns elements of the system. So, according to him, from the assertion of reality or unreality of the physical world we cannot deduce any perceptive propositions, and therefore both assertions have no empirical content and no sense at all.

The *Vienna Circle* view is mistakenly understood as denial of reality of the physical world. The point is that they reject this thesis not as false, but as having no sense. They neither assert nor deny these theses, but reject the whole question. All these philosophical theses are deprived of empirical content or theoretical sense, and they are nothing else than pseudo-theses. Carnap points that philosophical problems of reality, as distinguished from empirical problems of reality, have the same logical character as pseudo-problems of transcendental metaphysics. He called those problems of reality not epistemological but metaphysical. It is interesting that among metaphysical doctrines that have no theoretical sense Carnap has also mentioned positivism, explaining that philosophers of *Vienna Circle* do not assert the thesis that only the given is real (one of the principal theses of traditional positivism). It is important to realize that the doctrine of *Vienna Circle* is logical and therefore has nothing to do with metaphysical theses of the reality or unreality of anything whatever, and according to Carnap the *logical positivism* seems more suitable for the philosophy of the *Vienna Circle*.

Beside metaphysics and philosophy **ethics and value statements**¹¹ has also been regarded. The word „ethics“ is used in two different senses: a) ethics as an empirical scientific investigation belongs to empirical science and b) ethics as philosophy of moral values or moral norms, that can be designated as normative ethics and belongs to philosophy. Carnap mostly was interested in ethics in the second sense. The main purpose of normative ethics is to state norms for human action, or judgments about moral values. As he points out, it is

¹⁰ Ibid., p. 18-22.

¹¹ Ibid., p. 22-6.

difference of formulation whether we state a norm or a value judgment. But, this difference of formulation has become very important: a *norm or rule* has the *grammatically imperative form* and will therefore not be regarded as an assertion, while *value statement* is merely an expression of a certain wish, but like a rule has the *grammatical form of an assertive proposition*. The fact is that most of the philosophers have been deceived by this form, and regarded a value statement as assertive proposition which therefore must be either true or false. Actually, value statement is nothing else than a command in a misleading grammatical form, and it does not assert anything and can neither be proved nor disproved, and therefore it is neither true nor false. Thus, this statement is not verifiable and has no theoretical sense, and the same is true of all other value statements. But, it must be said that Carnap's intention is not to deny the possibility and importance of scientific investigation of value statements as well as acts of valuation. He assigns them to the realm of metaphysics, propositions of these kinds are not verifiable and their truth cannot be examined by experience, which is the reason why they don't have the character of scientific propositions. These propositions express something, but nevertheless they have no sense, no theoretical content. Here Carnap distinguishes the two most important functions of language: *expressive* and *representative* function¹². His anti-metaphysical view can be represented by the thesis that metaphysical propositions have only expressive, but no representative function. Metaphysical propositions are neither true nor false because they assert nothing, they contain neither knowledge nor error, lie completely outside the field of knowledge, of theory, outside of discussion of truth or falsehood. But, there is one decisive difference between them. Both have no representative function, no theoretical content. However, a metaphysical proposition seems to have some. Specific non-theoretical character of metaphysics is not defect, all arts have this specific character without losing anything of their value (for personal and social life). To Carnap the real danger is in *deceptive* character of metaphysics because it gives the illusion of knowledge without actually giving any knowledge and this is the reason why he rejects it.

¹² Almost all human movements and words can be taken as symptoms from which it is possible to infer something about his feelings or his character, and this is the *expressive function* of movements and words. But, certain portion of linguistic utterances has a second function, namely *representative function*. This kind of utterances tells that something is so and so, they assert or predicate or judge something. In special cases, this asserted state can be the same as that which is inferred from a certain expressive utterance. But, as Carnap pointed out, even in such cases we must sharply *distinguish between the assertion and the expression*. For instance, there is a fundamental difference between the laughing and the words: linguistic utterance „I am merry now“ *asserts* the merry mood, and therefore it is either true or false. The laughing does not assert the merry mood but *expresses* it, and therefore it is neither true nor false. What Carnap wants to say is that many linguistic utterances are analogous to laughing, in the sense that they have only an expressive function, and no representative function (a lyrical poem has no assertion sense, no theoretical sense and it does not contain knowledge).

The final step in his analysis of various kinds of expressions concerns the **psychological**¹³ questions and propositions, and he tried to eliminate them not from the region of knowledge but from philosophy. Why? In this way philosophy can be reduced to logic alone. In Carnap's opinion psychological questions and propositions are not without sense because it is possible to deduce other propositions about future experiences, and to verify the psychological propositions. But, the fact is that propositions of psychology belong to empirical science. The members of Circle have no objection to connecting psychological and logical investigations, but they reject the confusion of these two kinds of questions, and demand that these should be clearly distinguished. Why is it necessary? The reasons lay down in confusion of dealing with logical questions as if they were a psychological one, confusion that is known as psychologism. Psychological questions concern all kinds of mental events, all kind of sensations, feelings, thoughts, images, etc., no matter whether they are conscious or unconscious, and these questions can be answered only by experiences, and not by philosophy. A certain sort of **antipsychologism** was generally accepted in the 1930s, especially by Carnap concerning the founding of the validity of logical sentences. One point of Popper's¹⁴ thought have made the great impression on Carnap, namely his *radical elimination of psychologism*. Carnap has already tried to overcome psychologism by means of his *distinction between material and formal modes of speech*.

1.3. *Metalogic and Formal Theory*

What the analysis of the above-mentioned kinds of expressions really means? It means that logical analysis is already used: Carnap tried to determine the character of physical hypotheses, metaphysical and philosophical propositions, value statements, and psychological propositions. He emphasizes that such kind of propositions has only *expressive but not representative function* and that they have no theoretical content, and therefore they are neither true nor false. What he has done is the application of logical analysis to logical analysis itself,

¹³ Rudolf Carnap, *Philosophy and Logical Syntax*, p. 31-5.

¹⁴ In: Ramon Ciera, *Carnap and the Vienna Circle*, Empiricism and Logical Syntax; Amsterdam – Atlanta, GA 1994. Popper's epistemology, or his logic of scientific discovery, was very interesting for Carnap. This conception is connected with the treatment of scientific sentences. Since in this way it is possible to determine the rules of the scientific method, what we have is a certain methodology, and in Popper's opinion methodology is not pure logic (the rules of scientific method are not tautologies) or an empirical science which deal with the real behavior of scientists and the procedures that they use. For him, the rules of methodology are conventions and not empirical truths, and these rules provide a definition of empirical science. The main theses are: first – justification of sentence is logical operation which has to do with other sentences and not with experience, second – there is no privileged sentences in the science enjoying an absolute form, and third – distinction between material and formal modes of speech is useful. Popper's methodological conventions are not empirical, but analytic. These analytic sentences refer purely to linguistic questions, and they must be formulated in the formal mode.

determining the character of logical propositions as the result of logical analysis. In other words, *logical analysis*, as the only proper task of philosophy, is the syntactical method that is known as *logical syntax*. In his „*Attempt at metalogic*“, the first version of his book „*Logical Syntax of Language*“, Carnap defines metalogic as the theory of forms of the expressions of language. Later he used „syntax“ instead of „metalogic“ or, in distinction to syntax as part of linguistic, the term „logical syntax“. In his *metalogic* he emphasized the distinction between language that is the object of the investigations, called **object-language**, and the language in which the theory of the object language is formulated, called **meta-language**. His aim was to make the meta-language more precise, so that an exact conceptual system for metalogic could be constructed in it. He thought of logical syntax as analysis dealing exclusively with the forms of expressions. The form of expression is characterized by the specification of signs occurring in it, and order in which they occur. In logical syntax no reference to the meaning is made, and it must be possible to establish logical syntax without establishing the meaning. Here only logical structure of expressions is involved and it is clear that syntax (or meta-language that serves for the formulation of logical syntax) contains only logical constants. Carnap shows that the concepts of the formal theory of deductive logic (provability, derivability, logical independence) are purely syntactical concepts and their definitions can be formulated in logical syntax (since these concepts depend merely on the forms of the sentences and not on their meanings). Development of logical syntax is connected with his aim to explain the nature of logical truth and logical inference, where the main issue is the substantive role that logic plays in the new empiricist foundation of knowledge. This was not his original idea, and it was Russell¹⁵ who undertook the replacement within empiricist doctrine of psychologist association by logic. This is not surprising if we know that Russell has considered that logic propositions constitute an example of certain knowledge. But, this explanation was unsatisfactory, and after rereading Frege¹⁶, Carnap accepted the *analytic nature of logic*. The expla-

¹⁵ After abandoning the idealism (during his early days he was influenced by the then dominant absolute idealists McTaggart and Bradley) Russell was concentrated on pure mathematics, but he didn't go directly from idealism into logicism and logical atomism (that marked his mature philosophy). Around the time of *Principia Mathematica*, he briefly adopted Platonic realist theory, which represented a version of a referential theory of meaning, according to which every linguistic expression stands for some things, with some sort of „being“ (if not necessarily existence in space and time). „Being“ is that which belongs to every conceivable term, to every possible object of thought, or to everything that can possibly occur in any proposition, true or false. In: James Baillie, *Contemporary Analytic Philosophy*, Prentice Hall, Upper Saddle River, New Jersey 1996.; and *The Cambridge Dictionary of Philosophy*, ed. R. Audi, Cambridge University Press, 1999.

¹⁶ Frege's philosophical theories represent the development of his treatment of problems in the philosophy of mathematics. He held the thesis of logicism, namely that concepts of mathematics could be defined in terms of those of logic, and mathematical truths derived from logical axioms. In order to prove this logicist thesis, he needed to develop a language in which logical properties and relations could be precisely stated. Since he believed that natural languages were inadequate, subjected to vagueness and ambiguity, he has constructed an

nation of nature of logic was linked to conception of philosophy focused on the analysis of language, which regards the language of science as the only meaningful one, and considers the traditional problems of philosophy to be pseudo-problems derived from an erroneous use of language. Explanation that logical truth is a truth wholly dependent on language, was very useful to Carnap, but he needed to explain how there could be statements that are true only by virtue of the characteristics of language itself. He already pinpointed this problem, since the incorporation of Quine's „*linguistic doctrine of logical truth*”¹⁷. Quine regards the standard positivist criterion that statement is analytic when it is true by virtue of meanings and independent of fact. In his opinion this criterion *cannot distinguish logical from analytic truths*, and it seems obvious that we can characterize analytic truth as derivable from logical truth by means of the *substitution of synonyms*. Of course, this notion of substitution of synonyms is very closely connected with his notion of *interchangeability salva veritate*, which has to be the touchstone of synonymy. The question that remains is whether interchangeability *salva veritate* is condition strong enough for the synonymy. It is important to notice that here we have the notion of *cognitive synonymy*: the sort of synonymy such that any analytic statement could be turned into logical truth by putting synonyms for synonyms. The linguistic doctrine of logical truth makes this truth dependent exclusively on language and it asserts that logical truths are propositions true in given language. In Carnap's opinion the choice between the different logics should be viewed in the possibilities of choice among different languages. Since he became acquainted with different language forms of *Principia Mathematica*, with Lewis' modal logic, Brouwer's intuitionist logic¹⁸, and Quine's analytic philosophy and logic,

artificial language – his *Begriffsschrift*. In the *Begriffsschrift* a propositional calculus is offered, in which all logical laws could be derived from an axiomatic base. Frege differ logical laws from empirical causal laws that can be formulated concerning relationships between judgments, and maintains that thoughts are related by logical laws, since he regards thoughts as abstract objects existing independently of individual judgments. Abstracta were distinguished from physical object existing in space and time as well as from ideas in the mind, and they are objective in the sense of being inter subjective. In: James Baillie, *Contemporary Analytic Philosophy*, ed. R. Audi, Cambridge University Press, 1999.

¹⁷ As it is known, the theory of reference includes reference, truth and logical truth, and it is sharply demarcated from the theory of meaning, which includes meaning, synonymy and the analytic-synthetic distinction. Quine criticizes the notions of the theory of meaning, arguing that distinction between merely linguistic or analytic truths and synthetic truths has failed. He explores the limits of empirical theory of language, and offers his indeterminacy of translation as further criticism of the theory of meaning. In: *The Cambridge Dictionary of Philosophy*, ed. R. Audi, Cambridge University Press, 1999.

¹⁸ Brouwer's general orientation in the philosophy of mathematics was Kantian, which was manifested in his radical critique of the role accorded to logical reasoning by classical mathematics. The fundamental part of his critique is the attack on the *principle of the excluded middle*, and related principles of classical logic, where he challenges their reliability (unrestricted use of certain logical principles leads to results that are not true). Both logical structure and logical inference are the product of linguistic representation of mathematical thought (not a feature of that thought itself). He stated this view in his two famous ideas called *the first act of intuitionism* and *the second act of intuitionism*, ideas that form the base of his philosophy of mathematics. In: *The Cambridge Dictionary of Philosophy*, ed. R. Audi, Cambridge University Press, 1999.

he did recognize the infinite variety of possible language forms. He became aware of problems of language forms suitable for given purposes: we cannot speak about the „correct language form“ because various forms have different advantages in different respects, and this latter insight leads to his *principle of tolerance*.

Carnap was aware that there is a large divergence between the two wings of analytic philosophy, especially concerning the question of natural versus constructed languages. He pointed out that *Vienna Circle* takes mathematics and empirical science as models of representation of knowledge, and that all philosophical work on problems of knowledge should be oriented in same direction. The chief motivation for his development of syntactical method contains in an attempt to formulate (more precisely) various philosophical problems that end up with problems of logical analysis of language. Philosophical problems concern the language, not the world, and therefore these problems should be formulated not in object-language but in meta-language. The development of suitable meta-language would contribute to greater clarity in the formulation of philosophical problems, and greater fruitfulness in their discussions.

So, the investigation of philosophical problems was originally the main reason for the development of syntax. But, Carnap's efforts were directed toward developing the formal features of the syntactical method, which is obvious since he exhibited his method by giving syntactical rules for two model languages, L I and L II. *L I* includes definition of concepts and formulation of propositions, and it is introduced in usual manner: the symbols are presented, the rules based on these constituting well-formed formulas are given, the transformation rules and the deductive calculus of the language are presented. L I contains explicit and recursive definitions, and once the definitions are available it is possible to distinguish logical and descriptive symbols (and expressions). The primitive descriptive symbols are functions and predicates, and defined descriptive symbols are those in whose definition appears primitive descriptive symbols. All other symbols are logical. Transformation rules provide the definition of 'consequence', in the same way in which the totality of formation rules is equivalent to the definition of 'sentence' (or formula). L I has a structure of axiomatic calculus and rules are provided by a set of axioms (axiomatic schemes). With these it is possible to arrive at the notion of (direct) derivability and derivation of the consequence is a key point in logical syntax. All other notions depend on it (like analytic truth, contradictory, logically valid, etc). The rule of consequence refers to infinite classes of sentences. Carnap distinguishes two different methods of deduction, *derivation* and the method of *consequence-series* (it corresponds to relation of 'logically following'). L II is indefinite language with unlimited operators and variables of higher order, organized hierarchically in types. L II is

more comprehensive and makes available sentential forms for formulating everything occurs in classical mathematics and classical physics. Accepting 'analytic' as syntactic notion, Carnap obtained that all sentences of logic and mathematics are empty – they say nothing about the world, and their truth depends entirely upon the language to which they belong. If choice of language is convention based on pure practical convenience, than all sentences are true by convention too. But, the question is which language should be constructed, and according to him it is more fruitful to develop both languages than to declare the first language to be the only correct one, or to enter into controversy about which language is preferable. Here he pays more attention to *general syntax*, regarding it as a *system of syntactical concepts applicable to languages of any form*. General syntax has nothing to do with any particular individual language, but to all languages or to all languages of certain kind. Transformation rules and the definition of 'consequence' are also supposed, and all other syntactic notions depended on it, e.g. A-concepts are obtained from derivation (demonstrable, derivable, refutable), and F-concepts from the rules of consequence (notions such as analytic, consequence, contradictory, and alike). P-rules, or non-logical rules, occur when the laws of nature are included. To include an axiom in language means to change the language and introduce new transformation rules that must be justified which leads to view similar to Carnap's *principle of tolerance*. He refers to the difficulty with the treatment of P- and L-rules, since certain transformation rules are logical and others not, and distinction between P- and L-rules is based on division on *logical* and *descriptive signs/expressions*.

Carnap's main attention was the formal construction of theory, and logical syntax is to be understood as that *formal* theory of language. Assertions concerning linguistic expressions, without any reference to sense or meaning are formal, and formal investigation does not concern the sense of the sentence, or the meaning of the single words. The accent is putt only on the kind of words, and order in which they follow one another. This is explained by „the book is black“-example.¹⁹ We may assert that the expression consisting of four words is a sentence, the first word in „The book is black“ is article, second is substantive, third is a verb and fourth is adjective, and all these are formal assertions. If we assert that given sentence concerns a book, then this is not formal assertion since it is about the meaning of sentence.

The formal theory of language is already known in the case of mathematics regarded by Hilbert in his *metamathematics* as a theory of proof²⁰, in which formal method is applied (in his theory mathematics is taken as a system of symbols to be operated with according to

¹⁹ R. Carnap, *Philosophy and Logical Syntax*, p. 39-40.

²⁰ *Ibid.*, p. 40-41.

certain rules, and the meaning of symbols is not regarded). The theory regards only a various kinds of symbols and formal operations to which these symbols are subjected. In this sense *theory of logical syntax* can be seen as a generalization of Hilbert's method not restricted to the field of mathematical language, but including language as a whole. Since mathematics is taken as a special part of language, Carnap applied the same formal method in his logical syntax (to the language of science). If theory of language should be mathematically formulated, then it must be constructed without regarding the meaning of signs. But, this does not suppose that signs therefore have no meaning. Here, Carnap was looking for *synthesis between logicism and formalism* which would permit him to show that logic and mathematics are of the same epistemological species, as logicism demands, by making their sentences true by virtue of their pure form, regardless of any content. This would make *logical and mathematical theories purely formal or syntactic doctrines*, as formalism asserts. On the other hand, it is possible to overcome formalism by including mathematical calculations in language which has synthetic sentences of empirical science as its part. Tarski's influence can be recognized as well, and it was he who has convinced Carnap to consider two different languages, *object-language* and *meta-language*. Carnap accepted that only in meta-language it is possible to deal with the logical problems of object-language, as would later be shown in his Logical Syntax. The method through which he develops the arithmetization of syntax of formal language can be recognized as Gödel's influence. All these influences have one thing in common: they produced an effect on Carnap's philosophical conceptions that neither of two original authors accepted: Tarski never agreed with Carnap's distinction on logical and factual truth, and later on analytical and synthetic sentences, while Gödel was inclined to certain Platonism. In any case, they helped Carnap by posing the questions and constructing the tools for solution. Carnap's solution was related to philosophical views of *syntacticism* and *conventionalism*, and he maintained that the *possibility of speaking about language* includes the possibility of giving a meaning to philosophical problems. The main reason was to justify the need of establishing the meta-language, required for the treatment of philosophical problems.

1.4. Rules and Modes of Speech

The object of logical syntax is language/s, and language has to be understood as a *set of symbols* and a *system of the rules of speaking*, as distinguished from the acts of speaking. The main distinction is on *formation* and *transformation rules*.²¹ Formation rules determine how sentences can be constructed out of the different kinds of symbols. So far, one formation

²¹ Ibid., p. 41.

rule is already introduced, the rule that series of four words constitutes a sentence. Formation rules are similar to grammatical rules, but usually the rules of grammatical syntax are not always strictly formal. In the context of grammatical syntax some references to the meaning of words are possible, and such references are excluded in logical syntax. In general, the totality of formation rules can be taken as definition of sentence, and for natural language they cannot be given completely.

Logicians have made frameworks for different languages and language system itself, but these frameworks and language system are much simpler and much more exact than the natural languages. Instead of words, logicians use symbols similar to mathematical symbols, and here the symbolic language of *Principia Mathematica* is used, and two principal formation rules:²² first – expression consisting of predicate and one or more individual variables is a sentence, and second – expression consisting of two sentences and one connecting sign (conjunction, disjunction, implication and equivalence) between them is also a sentence. Beside formation rules, Carnap finds that *transformation rules* are much more important, since they determine how given sentences may be transformed into others, or how it is possible to *infer* other sentences from the given one. The totality of transformation rules can be formulated as the definition of „direct consequence“, the most important terms of logical syntax.

Since language is a system of formation and transformation rules, logical syntax consists of two parts: analysis of formation rules and analysis of transformation rules. The first analysis is similar to grammar and second to logic, especially to logic of inference or deduction. It is generally supposed that grammar and logic have different form, where grammar is concerned exclusively with linguistic expressions, and logic with *meaning* of thoughts/propositions. But, Carnap points that modern logic shows more and more clearly that *the rules of inference can be expressed in a purely formal manner*, or without any reference to meaning. His aim was to construct the whole system of logic in strictly formal way, and he was interested neither with thoughts as mental acts nor with their contents, but with sentences as series of symbols, without any reference to meaning or sense of sentence. To Carnap, there is no fundamental difference between logic and grammar, or transformation and formation rules. Transformation or inference depends only upon the formal character of the sentences, or their syntactical form. Carnap applies syntax to system containing both kinds of rules, while in linguistic the term „syntax“ is applied to formation rules only.

²² Ibid., 43.

Main *syntactical terms* are *sentence* and *direct consequence*, and on the ground of these two terms all other syntactical terms can be defined. Carnap gives the definitions of the most important syntactical terms, especially those concerning the philosophical questions. He continues his analysis and deals with sentences and their truth values. The main problem was the fact that terms „true“ and „false“ cannot be defined in syntax. Whether a given sentence is true or false depends not only upon the syntactical form of sentence, but upon experience, or something extra-linguistic. It is possible for sentence to be true or false only by reason of the rules of language, and such sentences Carnap calls *valid* (true), or *contravalid* (false, every sentence that can be disproved in one and the same language system is contravalid). Sentences are *determinate* or *indeterminate*, the first are valid or contravalid sentences (those whose truth value is determined by the rules of language), while *indeterminate* are sentences that are neither valid nor contravalid. Indeterminate sentences can be constructed by introduction of non-logical constants, and their truth value is not determined by the rules of the system. This shows that it is possible to state a language that beside logical contains extra-logical rules as well. This is why Carnap makes distinction between logical and extra-logical rules, applying it to transformation rules, and distinguishing transformation rules of logical character or *L-rules* (logical rules), and those of extra-logical character or *P-rules* (physical rules). This distinction is very important since it can be define in an exact and strictly formal way, without any reference to meaning. In the case when only L-rules are applied the sentence is *L-consequence*, and when only P-rules are applied the sentence is *P-consequence*. Sentence true by reason of L-rules alone is *L-valid* or *analytic* sentence, and sentence false by reason of L-rules is *L-contravalid* or *contradictory* sentence. A sentence is *L-determinate* if it is either analytic or contradictory, and when L-rules are not sufficient or if sentence is not L-determinate the sentence is *L-indeterminate* or *synthetic* (those that assert states of affairs). The basic L-terms are 'analytic', 'synthetic' and 'contradictory', and they are very often used in logical analysis of any scientific theory.

But, another aspect of logical syntax was interesting for Carnap, namely the *content* of sentence. He pointed out that if we want to characterize the content or assertive power of sentence, we have to regard the class of those sentences which are consequence of the given sentence. Among these consequences he leaves aside the valid sentences, because they are consequence of every sentence, and on this ground he defines *content* as class of non-valid consequences of given sentence.²³ The method used here is the method of logical syntax, and

²³ Ibid., 56.

interesting question is whether the method of logical syntax is able to deal with the questions of sense. His reply is that this method is able to do that, at least in a certain respect. The content of sentence represents its sense, if 'sense' designates something of *purely logical character*. Carnap wants to say that in logical analysis we are not concerned with psychological questions, and all questions of sense having a logical character can be dealt with by the formal method of syntax. Further important distinction is between *equipollent* and *synonym expressions*²⁴: two sentences consisting of different words but having the same sense, or asserting the same state, are *equipollent*. They are equipollent if they have the same content, or if they are consequences of each other. Similarly, two expressions which are not themselves sentences, but occur in sentences, and have the same sense or the same meaning (in spite of different wording) are *synonymous*. Two expressions are synonymous if the content of any sentence containing one of them is not changed if we replace that expression by other.

The result of syntactical analysis is *syntactical sentence*, but there are other sentences that seem to be of quite different kind, but which are syntactical. In Carnap's opinion philosophical sentences belong to syntax, and his intention was to show that philosophical sentences just seem to concern the object mentioned, but they really concern linguistic forms, and here he distinguishes three kinds of sentences: *syntactical sentences*, *real object-sentences* and *pseudo object-sentences*.²⁵ Syntactical sentences concern the form of linguistic expressions, in contrast to those that concern not linguistic expressions, but extra-linguistic objects, known as real object-sentences. An intermediate kind of sentence are pseudo object-sentence, they are amphibious, being like object-sentences as to their form but like syntactical sentences as to their contents.

The above analysis shows that all sentences of empirical science, those asserting facts, no matter whether they are general or individual, are real object-sentences. On the other hand, all sentences of logical analysis (and philosophy too) belong to first or third kind, and in Carnap's further analysis these two kinds are chiefly considered. They don't differ in their content but in their *formulation*. Pseudo object-sentences are sentences of *material mode of speech*, and syntactical sentences of *formal mode of speech*.²⁶ The distinction on material and formal mode of speech is one of the most important decisions that Carnap made, which is made clear by following example:²⁷

²⁴ Ibid., 57-8.

²⁵ Ibid., 60.

²⁶ Ibid., 64.

²⁷ Ibid.

1. the sentence: „The first chapter treats of metaphysics.“ is example of the sentence of material mode of speech;
2. the sentence: „The first chapter contains the word 'metaphysics'“.“ is example of the sentence of formal mode of speech.

By this distinction Carnap wanted to show that many philosophical assertions are nothing more than assertions about language. The sentences of material mode of speech can be translated into sentences of formal mode of speech, and the last ones belong to syntax. The notion of *translation* from the first mode to the second mode is purely syntactical, and the same holds for *interpretation*, which is nothing more than a case of translation. The requirements of translation are formal, meaning that a translation of protocol sentence must be a protocol sentence too. Beside syntactical Carnap regards *quasi-syntactical*²⁸ sentences as well, sentences which do not deal with objects and properties of objects, but with *sentential frameworks*²⁹ and arguments of these frameworks. Quasi-syntactical sentences correspond to the material mode of speech, and translation that takes each quasi-syntactical sentence to its syntactical counterpart, and correlates any other with itself, in fact is *translation from material to formal mode of speech*. It is not surprising that Carnap was interested in the sentence of material mode of speech, in order to show that they have the deceptive character, and they seem to concern something which they in fact do not concern. He points that the most of the sentences of philosophy are deceive in this way, since most of them are formulated in this mode of speech. He thought of philosophy as the application of syntactical method, and one of its main tasks is logical analysis. Main questions that have to be answered are what logical analysis is, and what kind of sentences express the results of logical analysis, and Carnap concludes that the results of logical analysis are sentences (very often) expressed in material mode of speech. The sentence of material mode are not necessarily pseudo-theses or without sense, but they often mislead us into stating other sentences that are so, and the solution is to translate these controversies and pseudo-questions (but not all) into the formal mode. By this translation it is possible to free logical analysis from all reference to extra-linguistic objects and then we are concerned with the form of linguistic expressions.

²⁸ Ramon Cirera, *Carnap and the Vienna Circle*, Empiricism and Logical Syntax, ed. Amsterdam – Atlanta, GA 1994, p. 253.

²⁹ Ibid.

2. The Method of Extension and Intension

2.1. Symbolic Language System S and its Basic Concepts

In order to present Carnap's semantics and his method of semantic analysis it is necessary to explain symbolic language system S and its basic concepts. The preliminary explanation concerns object languages, the three main semantic language systems S_1 , S_2 and S_3 . His „Meaning and Necessity“ Carnap started with S_1 that contain customary *connectives*: negation, disjunction, conjunction, conditional or material implication, and biconditional or material equivalence. The only variables occurring are *individual variables* (' x '), and for these the customary *universal* and *existential quantifiers* are used. All sentences in S_1 are closed and they do not contain any free variables. Two other operators are *iota-operator* for individual descriptions (' ιx ' means 'the individual x such that ... x ...'), and *lambda-operator* for abstraction expressions (' λx ' means 'the property or the class of those x which are such that ... x ...'). If sentence consists of abstraction expression followed by individual constant, the individual *has the property* in question. The rules of S_1 permit the transformation known as *conversion*. S_1 contains *descriptive constants (non logical)* – constants of individual and predicate types. The number of predicates is supposed to be finite, while the number of individual constants may be infinite. For some of the constants the meaning is stated by semantical rules.³⁰

To complete the construction of S_1 Carnap maintains the four main rules:³¹ the *rules of formation* which determine the admitted forms of sentences, the *rules of designation* which serve for the descriptive constants (individual constants and predicates), the *rules of truth* and the *rules of ranges*. He was especially concerned with the *rules of truth* and he gave the rules of truth for atomic sentences, disjunction and equivalence.

According to the *rule of truth* an atomic sentence in S_1 , consisting of predicate followed by an individual constant, is *true* if and only if the individual to which the individual constant refers possesses the property to which the predicate refers. This rule presupposes the *rules of designation* and yields to the *rule of truth for disjunction* according to which sentence ' $S_i \vee S_j$ ' is true iff at least one of the two components is true, and to the *rule of truth for equivalence* according to which sentence ' $S_i \equiv S_j$ ' is true iff either both components are true or both are false. Concerning „ \equiv “ we may distinguish several cases. The first is biconditional between individual expressions (*individual constants* or *descriptions*) and it takes place of the

³⁰ Rudolf Carnap, *Meaning and Necessity* (A Study in Semantics and Modal Language), The University of Chicago Press, 1955, chapter I, p. 4.

³¹ *Ibid.*, p.5.

identity sign. Second is expression formed by interposing „ \equiv “ between two n-place *predicates* defined as standing for the same expression with appropriate variables in the predicate places (and the whole closed with the universal quantifiers), and third is biconditional between *sentences* that has its usual meaning. There are rules of truth for other connectives, corresponding to their truth-tables, and the rules of truth for the quantifiers. These rules together constitute a *recursive definition for 'true in semantic system S_I '*. Together with designation rules, they determine **sufficient** and **necessary condition of truth** for every sentence in S_I , they give the *interpretation* for every sentence. But, in order to speak about any object language, like S_I , and to explain the truth definition as applied to sentences, it is necessary to establish a *metalanguage*. For metalanguage (M) Carnap uses a suitable part of English language that contains translations of sentences and other expressions of object languages, names or descriptions of those expressions and special semantic terms. Expression in metalanguage M refers to expression of the object language. Here, 'sentence' is used in the sense of '*declarative sentence*', and the term '*semantic matrix*', or '*matrix*', as expressions that are either sentences, or formed from sentences, by replacing individual constants with variables.

In the „Meaning and Necessity“ it is presupposed that statement in M (saying that sentence in S_I is true) means the same as the translation of that sentence. By means of 'true' Carnap defines other semantic terms, defining *falsity* and *equivalence*. *Falsity* is defined as the case of negation of truth and has its ordinary meaning, and *equivalence* is defined as agreement with respect to the truth-value. Definition of equivalence and the rule of truth for equivalence yield that two sentences are equivalent iff both have the same truth-value. This relation is known as '*material equivalence*' (this term is not used in the sense of agreement in meaning, which is known as '*logical equivalence*', for the latter concept Carnap introduces the term '*L-equivalent*').

Designator is used for all expressions to which semantic analysis is applied. *Meaning* is understood as *designative meaning* (also known as *cognitive*, *theoretical*, *referential* or *informative*). Carnap distinguishes this concept of meaning from other meaning components, *emotive* or *motivate meaning*, and he was concerned only with *declarative sentences* and their components. Due to the designative meaning, in his method of extension and intension Carnap takes *sentences*, *predicators* (predicate expressions), *functors* (expressions for functions but excluding propositional functions), and *individual expressions* as designators. Other types of expressions, like extensional and modal connectives, may be included if it is necessary. The term *designator* implies that these expressions have an independent meaning and they are not just names of some entities. Only declarative sentences have designative meaning in the

strictest sense, meaning of the highest degree of independence. All other expressions derive its meaning from the way in which they contribute to the meaning of sentences in which they occur. It is possible to distinguish different degrees of independence of the derivative meaning: Carnap attributes a very low degree of independence to expression like „()“, more degree to disjunction, a higher degree to addition, and still more to predicate. The question is where to make the cut between expressions with no degree of independence of meaning (in traditional terminology also known as 'syncategorematic'), and those with a high degree of independence? The right answer, as Carnap points, is a matter of convention: if we take that metalanguage is decided upon, then it seems convenient to take as designators at least all those expressions for which there are variables in the metalanguage.

Carnap finds important to make exact the concepts used in everyday life and earlier stage of scientific/logical development, and to replace them by new constructed and more exact concepts. This task belongs to logical analysis and logical construction, and it is the *task of explicating*, or giving the *explication* for an earlier concept. This earlier concept is *explicandum* and the new concept is *explicatum* of the old one. Many concepts defined in semantics are meant as explicata for concepts earlier used in everyday language/logic, e.g. semantic concept of truth has the concept of truth as its explicandum (truth used in everyday language and traditional and modern logic). Generally, it is not required that an explicatum have the same meaning as explicandum, it should correspond to it that it can be used instead of the latter. Main *L-terms* are introduced, and they are intended as explicata for the customary concepts. The starting point for the development of *the method of extension and intension*, and introduction of L-terms, has its background in Wittgenstein's notion of *state of affair* and Leibniz's concept of *possible world*. L-terms are introduced by the concepts of *state-description* and *range*, and Carnap defines ***state-description*** as a class of sentences in S_1 , which contains atomic sentence or its negation, but not both, and no other sentences. This class gives a complete description of possible state of the universe of individuals. A ***range*** is a class of all those state-descriptions in which a given sentence holds. Once he defined these concepts, he established the main semantic rules which determine whether sentence *holds (or not) in a given state-description*. That sentence holds in a state-description means that it would be true if the state-description (or all sentences belonging to that state-description) is true. So, an *atomic sentence* holds in a given state-description iff it belongs to it, and its *negation* holds in a given state-description iff the given sentence does not hold in it. Similarly, a *disjunctive sentence* holds in a state-description iff either first or second, or both, hold in it,

equivalence-sentence holds iff either both or neither of them hold in it, and *universal sentence* holds iff all substitution instances of its scope hold in it.

All rules together determine the *range* of any sentence in semantic system (like S_I), and they are known as the *rules of ranges*. These rules, together with rules of designation for predicates and individual constants, give the interpretation for all sentences in semantic system (like S_I).

For Carnap, to know the meaning of the sentence is to know in which of the possible cases it would be true, and in which not. He points out that there is one and *only one state-description* which describes the actual state of the universe, and that state-description contains all true atomic sentences and the negations of those which are false. So, it is obvious that the actual state-description contains only true sentences, and therefore it is called the *true state-description*. Sentence of any form is *true* iff it holds in the true state-description, and on this ground the main *L-concepts* are defined. ***L-truth*** is defined as explicatum for *logical* or *necessary* or *analytic* truth. The logical truth is taken as explicandum for *L-truth*, and sometimes has been characterized as truth based on purely logical reasons, or on meaning alone and independent of the contingency of facts. This means that the meaning of sentence, or its interpretation, is determined by the semantic rules. On this convention Carnap states that sentence is *L-true* in S iff its truth can be established on the basis of the semantic rules of S alone, which means without any reference to any extra-logical facts at all. But, this is not yet a definition of *L-truth*, but more informal formulation of condition which any proposed definition of *L-truth* must fulfill in order to be adequate as an explication for explicandum. So, that sentence is ***L-true*** (in S_I , for example) means that given sentence holds in every state-description (in S_I), and if sentence holds in every state-description, then semantic rules of ranges are sufficient for establishing this result. Furthermore, semantic rules establish the truth of sentence, because if sentence holds in every state-description, then it holds also in true state-description, and hence is itself true. ***L-falsity*** is, similarly to *L-truth*, explicatum for *logical* or *necessary falsity* or *self-contradiction*. Namely, if sentence does not hold in any state-description, in that case there is at least one state-description in which given sentence does not hold (whether this state-description is true or not depends upon the facts). Sentence is *L-false* iff it does not hold in any state-description, and this means that sentence cannot possibly be true. Thus, sentence is *L-false* in semantic system iff its negation is *L-true* in that system, and that negation of sentence is *L-true* means that given sentence does not hold in any state-description at all. ***L-implication*** is defined as explicatum for *logical implication* or *entailment*, and sentence *L-implies* other sentence iff the second sentence holds in every state-

description in which the first one holds. This means that it is not possible for the first sentence to be true and for the second one to be false, at the same time and in the same system. *L-equivalence* is defined as explicatum for *mutual logical implication* or *entailment*. Accordingly, a sentence is *L-equivalent* to some other sentence iff both hold in the same state-description, meaning that it is impossible that one sentence is true and the other false.

In accordance to these definitions, a sentence is *L-determinate* iff semantic rules alone, independently of facts, are sufficient for establishing its truth-value. Sentence is *L-determinate* if it is either *L-true* or *L-false*, otherwise it is *L-indeterminate* or *factual*. In other words, the sentence is *factual* iff there is at least one state-description in which it holds and at least one in which it does not hold. Since the semantic rules do not suffice for establishing the truth-value of sentence, it is not L-true but *F-true*, and Carnap defines main *factual* or *L-indeterminate* concepts. *F-truth* is defined as *factual* or *synthetic* or *contingent* truth, which is in contradiction to logical or necessary truth. This means that semantical rules are not sufficient for establishing the truth-value of sentence, and its truth-value depends of facts. Here Carnap goes beyond semantic analysis to the observation of facts, in order to show which facts are relevant for establishing the truth-value of sentence, and since semantic rules are not sufficient for establishing its truth sentence is *not L-true* but *F-true*. *F-falsity* is defined by means of *F-truth*, which means that sentence is *F-false* in semantic system iff it is false but *not L-false*. The same holds for *F-implication* meaning that the first sentence implies the other, but not L-implies it, and the statement of implication is F-true. A sentence is *F-equivalent* to other sentence iff the first one is equivalent but *not L-equivalent* to the second one, and the statement of equivalence here is F-true.

Carnap pays a special attention to *F-* and *L-equivalence*, and their application to all kinds of designators, especially to *predicators* and *individual expressions*. Extended in this way, these concepts become the fundamental concepts in the method of semantic analysis proposed by him. This is not surprise since he was interested in the semantic analysis of meaning of expressions of semantic system in general. The equivalence is customarily used between sentences, and it functions as connective between sentences. It is used between predicators and individual expressions as well: „ $\mathbf{a} \equiv \mathbf{b}$ “ is used, instead of customary „ $\mathbf{a} = \mathbf{b}$ “, as *identity sentence* saying that **a** is the same individual as **b**. It is used between two designators, if they are of the same type. Beside this, conjunction is also used between predicators, and the resulting expression „ $\mathbf{P} \bullet \mathbf{Q}$ “ is taken as predicator and not as a sentence. Having in mind two additional operators, Carnap reminds that expression „ $\mathbf{P} \bullet \mathbf{Q}$ “ is abbreviation for

„ $(\lambda x)[P \bullet Q]$ “, and is expression for the property, in accordance to the condition of *lambda-operation*. But, since „ \equiv “ is used as a primitive sign of identity between the individuals (instead of customary „ $=$ “), the *rule of truth* is established, according to which two predicates are equivalent iff they hold for the same sequences of individuals, and the individual expressions are equivalent iff they are expressions for the same individual.

By means of equivalence and L-equivalence Carnap defines *equivalence class* and *L-equivalence class*. Designators belong to both classes, L-equivalence class is a *subclass* of equivalence class, and both classes contain only designators of the same type. Beside *classes*, he defined the *properties* as well, and he has done that by analysis of meaning of adjectives, like 'human', or corresponding predicator like 'H'. Carnap points out that we usually speak about two entities, about the *property of being human* (*property Human*) and about the *class of human being* (*class Human*). For further explanation of classes and properties he introduces specific forms of translation. **Metalanguage *M*** must contain translations of sentences of object languages to be dealt with in *M*. The translation can be formulated in different ways, but he uses the simplest one into *M*.³²

1. 'Scott is human.'

Beside this there are two other translations of 'Hs' which are more explicit by using the terms *property* or *class*, but which have the same logical content:³³

2. 'Scott has the *property Human*.'
3. 'Scott *is an element or belongs to the class Human*.'

Carnap also gives the example of *direct translation*³⁴ and according to it 'for every x , if x is human, then x is a biped', by using the following sentence: ' $(x) [Hx \supset Bx]$ ', he obtains that:³⁵

4. 'The *property Human* **materially implies** the *property Biped*.'
5. 'The *class Human* is a **subclass** of the *class Biped*.'

He concludes that these examples show a certain parallelism between *two modes of speech*, namely the one in terms of 'property' and the other in terms of 'class'. Fundamental difference between these two modes (in one case connecting phrase is 'has' or 'possesses', in other is 'belongs to' or 'is an element of') is in **condition of identity**, and *classes* are usually taken as *identical* if they have the *same elements*. Under what conditions properties are

³² Ibid. p. 17.

³³ Ibid. p.

³⁴ Ibid.

³⁵ Ibid.

regarded as identical is less clear, but it seems natural and sufficient to regard properties as identical if it can be shown by logical means alone, without reference to facts. This means that whatever has the one property has the other and vice-versa (or if the equivalence sentence is not only true, but L-true). In this way Carnap managed to show that the *identity condition* can be formulated with respect to predicators of degree one, that *classes* are **identical** iff *predicators* for them are **equivalent**, and that *properties* are **identical** iff *predicators* for them are **L-equivalent**.

2.2. Extension and Intension

The two fundamental terms, **extension** and **intension**, are already introduced with respect to predicators. If *two predicators apply to the same individuals*, or if they are *equivalent*, they are *coextensive* or *have the same extension*. Since the two predicators have the same extension iff they are *equivalent*, then *two predicators have the same intension* iff they are *L-equivalent*. But, these conventions determine only the use of the phrases '*have the same extension*' and '*have the same intension*'. This usage could be sufficient for many purposes, but Carnap explains that the *first convention* means that as *extensions of predicators* we may take only something which is in common to equivalent predicators and as *intensions* something which is in common to L-equivalent predicators. In the case of equivalent predicators, the condition is fulfilled by corresponding classes, and in the case of L-equivalent predicators the condition is fulfilled by corresponding properties. The **extension of predicator** of degree one is the *corresponding class* and the **intension of predicator** of degree one is the *corresponding property*.³⁶ When this is applied to the predicator 'H' in the S_I we obtain that the **extension** of 'H' is the *class* Human, and the **intension** of 'H' is the *property* Human. This shows that there are many ways of choosing entities as extensions and intensions of predicators of degree one, which leads to linguistic and extra-linguistic entities. To avoid misunderstandings, the use of **property** Carnap explains by quality or characteristic (property includes whatever can be said meaningfully about any individual, truly or falsely). The term is used not only for qualitative (blue, hot, hard) but also for quantitative (five pounds), relational (uncle of somebody), spatiotemporal (north of Chicago), and other properties. Here Carnap points out that this term does not refer to linguistic expressions, but to symbol 'H' and corresponding word 'human', which means that we apply the term 'predicator' and not 'property'. Properties are not meant as something mental, but as something physical that things really have.

³⁶ *ibid.*

It is possible to form *compound predicators* and Carnap points out that we understand compound predicators because its meaning is determined by the meanings of the component predicators, and by meaning of the logical structure of the compound expression. Thus, the understanding of compound predicator is no longer dependent upon observations of any things to which it applies, or upon any things which have the complex property expressed by it. By compound predicators he understands expressions like negation, disjunction, and conjunction, and here we recognize the general form of the *principle of compositionality*. From a logical-philosophical point of view, it is important to deal with the *logical role of compositionality* within the context of extensionality and intensionality. First we have to explain what the compositionality is, and in scientific logical literature we can find a several versions of compositionality.³⁷ One form holds that the meaning of complex expression is determined by the meanings of its constituents and its structure, and this version is known as the *principle of compositionality*. Also, the meaning of complex expression could be taken as a *function* of the meaning of its constituents and its structure, or as it is *built up* from the meaning of its constituents, where compositionality is taken as building principle. Beside this, if two expressions have the same meaning, then the substitution of one for the other in a third expression does not change the meaning of the third expression, and this version is known as the *principle of substitutivity*.

The principle of compositionality used to work on the level of natural language, which means that logical structures had their origins in natural language and originated from natural language *directly*, based on compositionality of natural language. Logical laws get meaning through primitive structures (taken from natural language) and natural language meanings. But, this was situation before the distinction between *grammatical* and *logical structure*.³⁸ Beside work on the level of natural language, it works on the level of logical investigation or as *logical compositionality*. Frege broke up the identity between the grammatical structure of natural language expression and its logical structure. The former may appear as a possible logical structure, but an expression may have and do have logical structure different from its

³⁷ See: Audi, *The Cambridge Dictionary of Philosophy*, p. 147-153, and p. 673-677.

³⁸ Russell's well-known thesis of misleading form was developed in the footsteps of Frege's solution of the age-old problems with relational propositions and multiple quantification. His solution departs from the insight that every sentence (however complicated it may be) must be considered as the result of systematic step-by-step construction process (in each step one semantically significant syntactic rule is applied). This resulted in distinction between the logical form of a sentence and what was then seen as its grammatical form. It was this distinction that was expressed by Russell at the beginning of twentieth century in his thesis of misleading grammatical form. The thesis states that the grammatical form of a sentence is often misleading, and it can differ from its logical form in such a way that it appears to allow inferences which are in fact not justified. One of the tasks of philosophical analysis is to expose the misleading grammatical forms of natural language sentences for what they are, and to reveal their true logical forms. *Ibid*, p. 328-331, and p. 801-805.

grammatical structure. The principle of compositionality may be duplicated with respect to *reference* and *sense* of compound expression: *the principle of compositionality (or interchangeability) of reference* and *the principle of compositionality of sense*. These two principles hold that the referent/sense of complex expression is function of referents/senses of its constituent expressions. In fact, Carnap was first who has attributed both versions to Frege and refer to them as *Frege Principles of Interchangeability*:³⁹

- a. according to the *first principle of interchangeability*, the nominatum of the whole expression is a function of the nominata of the names occurring in it,
- b. according to the *second principle of interchangeability*, the sense of the whole expression is a function of the senses of the names occurring in it.

Both principles can be used in determining logical relevant semantic value, and such logical investigation concerns the truth value of sentence, its reference. We may conclude that the reference is produced by means of the first principle. But, the reference of the whole expression cannot be determined by means of references of its parts, and what we have is to consider sense as well. This contradicts the first principle of compositionality, and certain kind of solution consists in making the difference between customary (ordinary or direct) and oblique (or indirect) reference (the difference which is attributed to Frege⁴⁰).

The next important notion is *relation* which is meant neither as mental entity nor as expression, but rather as something expressed by certain designators, and it holds for two or more things. *Concept* is used as a common designation for properties, relations, and similar entities, including individual concepts and functions, it is not understood in a mental sense, or as referring to the process of imagining, thinking, conceiving and the like, but rather to something *objective* that is *found in nature* and *expressed in language* by designator of nonsentential form.⁴¹ Discussion about properties, relations, concepts, and propositions does not involve any kind of *hypostatization* (*substantialization* or *reification*), which according to Carnap consists in mistaking as things those entities which are not things. For example, the hypostatization of properties is formulation like 'the ideas have an independent subsistence'. This formulation is *pseudo-statement* and it is *devoid of cognitive content*, and therefore *neither true nor false*. On the contrary, *properties at least have cognitive content*.

³⁹ Rudolf Carnap, *Meaning and Necessity*, p. 51-53.

⁴⁰ Ibid.

⁴¹ Ibid. In Carnap's view, the traditional discussions concerning this problem are, in fact, heterogeneous mixture of different components, among them logical statements, psychological statements, and pseudo-statements, or expressions which are erroneously regarded as statements but do not have cognitive content (although they may have noncognitive- or emotive- meaning contents).

Entity is frequently used in the method of extension and intension, having some metaphysical connotations associated with, but Carnap points out that it is necessary to leave these connotations aside, and to take the word in the simplest sense. The simplest sense is a common designation for properties, propositions and other *intensions* – on the one hand, and designation for classes, individuals and other *extensions* – on the other hand.

The definitions of extension and intension for any kind of designators are introduced in analogy to predicators. As we have seen, the *equivalence is the condition for identity of extension*, and *L-equivalence is the condition for identity of intension*. Carnap did show that semantical concepts of *equivalence* and *L-equivalence* can be applied to the various types of designators, and that is the main reason why he takes the same conditions to define identity of extension and intension: „the two designators *have the same extension* in S_1 iff they are *equivalent* in S_1 , and they *have the same intension* in S_1 iff they are *L-equivalent* in S_1 “⁴². But, it is obvious that only the phrases 'have the same extension' and 'have the same intension' are defined, and if we want to speak about *extensions* and *intensions* themselves, we have to look for a special kind of entities, entities which can be assigned to designators, and Carnap has done that in the case of predicators, where the classes and properties are such special entities. The question is which suitable entities can be chosen for sentences and individual expressions, and one possible step could be the introduction of expressions into *metalanguage M*. This step must be taken with caution: the above phrases are based on the definitions of 'equivalent' and 'L-equivalent', and these on 'true' and 'L-true'. Carnap introduces these entities to define extension and intension. He states **that two designators may be equivalent in one language and not in other**, and the reason is that designators may have other or different meaning in the second language. This means that the *equivalence of designators is dependent upon the language*, while the *equivalence of two properties is not dependent upon language*, since it is *nonsemantical* and *nonlinguistic concept*. In its *transferred use* the term 'equivalent' belongs to metalanguage *M*, and not to the semantical part of *M* (it belongs to the *object part* of *M* – the part of *M* which contains the translations of sentences and other expressions of object language). Terms transferred from semantics to extra-linguistic entities Carnap calls *absolute terms*, and they are no longer relative to language. It is clear that the application of 'equivalent' and 'L-equivalent' to *intensions of designators* leads, together with the *identity condition*, to conclusion that if *two designators* are *equivalent* in S_1 , then their

⁴² Ibid., p. 26-7.

extensions are identical and their intensions are equivalent, and to conclusion that if two designators are L-equivalent in S_1 , then their intensions are L-equivalent or identical.

2.2.1. *Extensions and Intensions of Sentences*

Carnap regards the question of *extensions and intensions of sentences*, using the definitions of two designators who have the *same extension* and the *same intension*. Extension of sentences is something that equivalent sentences have in common, its *truth-value*, which leads him to definition that the *extension of sentence* is its *truth-value*.⁴³ However, it is customary to use the term '*extensional*' for *truth-functional connections*, such connections that the truth-value of the *full sentence* is a function of the truth-values of the *components*. We may recognize that there is a strong analogy between truth-values of sentences and extensions of predicators. A further step was to decide what entities have to be taken as intensions of sentences, and Carnap reminds that (declarative) sentence expresses a *proposition*. He does not use this word neither for sentences nor for sentences with their meaning, but for entities which themselves are extra-linguistic entities expressed by sentences. The main question here concerns the *condition under which two sentences express the same proposition*, and his decision was to take *L-equivalence* as condition of identity for intensions (having in mind that if two designators have the same intension they are L-equivalent), which leads him to the definition that the *intension of sentence* is the *proposition* expressed by it. **Proposition** is used neither for linguistic expression nor for subjective (mental) occurrence, but for something *objective* that may or may not be exemplified in the nature. Propositions have conceptual nature, and it is applied to any entities of certain logical type, or to those entities that may be expressed by (declarative) sentences. The question is *whether facts are propositions* of certain kind, or entities of different nature? While some philosophers are inclined to *identify facts with true propositions*, the others say that propositions are true or false and *facts* themselves are *neither true nor false*, but just *are*. According to Carnap proposition must be *true*, it must be *contingent* or *factual* (which means that it must be *F-true*), and *complete*, but the degree of completeness is not specified.⁴⁴ The maximum degree of completeness for facts is the totality of the actual world (past, present and future).

The greatest difficulty of explicating the concept of proposition is involved in the case of *false sentence*. They cannot be regarded as meaningless, because we understand their

⁴³ Ibid., p. 26.

⁴⁴ Ibid., p. 28. Carnap illustrates this problem by the following example: the proposition that something is blue is a true proposition. In other words, this thing has the property 'blue', but since the property 'blue' has a wide range, it is not specific but includes many different shades of blue (blue₁, blue₂, etc.).

meaning before we know whether they are true or false, and therefore these sentences express propositions as well, but they cannot have the same relation to facts as the proposition expressed by the true sentence. The crucial difference is that the latter proposition is exemplified by a fact, namely the proposition expressed by the true sentence, while the former ones are not. So, the main question is *what these false propositions actually are?* Are there any entities of which it is possible to say that they are expressed by that false sentences, but it is not possible to point out to any exemplifying facts? Trying to answer these crucial questions Carnap has considered Russell's solution⁴⁵. Russell uses 'proposition' for what is expressed by sentence (the signification of sentence), but it was very difficult to find an entity of this kind in the objective or factual realm, and since sentence may be false, the signification of sentence cannot be the fact that makes sentence true or false. It must be something in the person who believes the sentence, and not in the object to which the sentence refers. In this way, he defines propositions as psychological and physiological occurrences of certain sorts. This means that sentences signify something other than themselves. According to Carnap, it seems that Russell took subjective or mental explicatum for proposition, and the reason is that there is no other way of overcoming the difficulty connected with false propositions. On the contrary to Russell, Carnap believes that it is possible to give an *objective interpretation* of proposition, but which is still applicable in the case of false sentences. Any propositions must be regarded as *complex entity consisting of component entities*, which may be simple or complex as well. He explains that the fact that some sentences are false does not exclude the explication of *propositions as objective entities*, and concludes that propositions, just like complex properties, are complex entities, and even if their ultimate components are exemplified, they themselves need not be. The result is that the *difference between propositions and complex properties* is merely a *difference in logical type*, meaning that the kind of connection is different.

In order to be more detailed about his method of extension and intension, Carnap regards the concept of *(individual) description*, and *individual* is used for entities taken as elements of the universe of discourse in *S*, and not for one particular kind of entities, and these entities are of the lowest level or *level zero*. The variables of level zero are *individual variables*, the constants – *individual constants*, and all expressions of this level, simple or compound – *individual expressions*.⁴⁶ The entity for which description stands, or to which it refers, is *descriptum*, and in the case of individual description the *descriptum* is an *individual*. Carnap determines two possible cases: the case where there is exactly one individual which

⁴⁵ Ibid., p. 29-30.

⁴⁶ Ibid., p. 35.

fulfils the condition expressed by the scope, and the case where this does not hold (where there is none or several such individuals). The first case is much more interesting and it satisfies the *uniqueness condition* (description satisfying the uniqueness condition in S_I is actually true in S_I). In this case there is general agreement that the individual satisfying the scope is *descriptum*. In other case there is no such agreement, and various methods have been proposed, and Carnap outlines three of them (method proposed by Hilbert and Bernays, method proposed by Russell, and method proposed by Frege)⁴⁷.

The first method permits the use of description only if it satisfies the uniqueness condition, and this system is a system with natural numbers as individuals, constructed as calculus and not semantical system. This is the reason why the formula of uniqueness is required to be *provable*, instead of true. This method is adequate for work with a *logico-arithmetical system*, and this means that description is used only after its uniqueness has been proved. In Carnap's opinion the main problem of this method is that the rules of formation become indefinite, which means that there is no general procedure for determining whether any given expression of the required form is a sentence of the system.

Second method, proposed by Russell, presupposes that description is taken as a sentence. The uniqueness condition is taken not as precondition for the sentential character of expression, but as one of *its truth conditions* (namely as a part of its content). Russell's *contextual definition for descriptions*, with exact definiendum and definiens, is taken as a rule for transforming a sentence containing the description to sentence with the same meaning without description. The advantage of this method is that description is always sentence, and the disadvantage is that the rules for description are not simple as those for other individual expressions, especially those for individual constants. Sentence with negation can be transformed in two ways and hence we deal with two types of negation, and the two resulting sentences are not L-equivalent, which is the reason why Carnap finds this method not adequate.

The third method is Frege's method according to which the expression of grammatical form 'so-and-so' cannot be regarded as a name of one object only in some cases. It is wrong to regard that some descriptions have descriptum while others don't, and the rules of language should be constructed in such way that *every description has a descriptum*.

The main question is whether it is possible to choose any individual as common descriptum for all descriptions which do not satisfy the required condition of uniqueness, and Carnap's suggestion is that we have to regard the *descriptions with the variables of other than individual type*, like *predicator variables*, *functor variables* and *sentential variables*.

⁴⁷ Ibid., p. 33-8.

2.2.2. *Extensions and Intensions of Individual Expressions*

To define *extension and intension for the individual expression* it is necessary to deal with F-equivalence and L-equivalence of individual expressions. As we know, individual expressions are equivalent iff they are expressions for the same individual, and according to the definition of identity of extensions, individual expressions have the same extension iff they are expressions for the same individual. Carnap regards the individuals as extensions of individual expressions, which leads him to definition that the ***extension of individual expression*** is *individual* to which it refers (descriptum, if it is description).⁴⁸ According to definition of identity of intensions, the intension is something that L-equivalent individual expressions have in common, and Carnap has found the entities suitable to be intensions of designators: for sentences those entities are propositions, for predicators those entities are properties or relations, and for functors those entities are functions. The intension of individual expression is the *individual concept* expressed by it.⁴⁹ From now on instead of saying that two L-equivalent descriptions have the same meaning we can say that they have the same intension, and that their common intension is the individual concept. Intension of given expressions, as well identity or nonidentity of these intensions, can be determined on the basis of the semantical rules alone. Important distinction is between *individuals* and *individual concepts*, explained by the example of 'Scott/the author of Waverley is human' in the context of translation to metalanguage ***M***. The question of multiplicity of entities and formulations, and their possible reduction Carnap remains open to discussion.

The choice of certain language structure and the decision of using a certain type of *variables* is practical decision and depend upon the purposes for which language is intended to be used. Once we admit certain variables we have to admit the corresponding universal concepts as well. If we overlook this fact we have to accept that language of science contains the variables of the customary kinds (sentential variables, numerical ones, etc.), which often results with misgivings against words like proposition, number, property, class, function, etc. Such remarks regarding the problem of variables concern the language which is not just analyzed but also used by somebody. Carnap's main goal was to determine the *role of variables* in an object language (***S***). If ***S*** is given then metalanguage ***M***, intended for the semantical analysis of ***S***, must be adequate and rich enough in relation to ***S***. This means that ***M*** must contain variables whose ranges of values cover those of all variables in ***S***. Carnap presupposes that metalanguage enables us to speak in general terms about *extensions* and

⁴⁸ Ibid., p. 40.

⁴⁹ Ibid., p. 41.

intensions of predicates, sentences and individual expressions of object language. His suggestion is that object language *S* should contain individual variables, as well as those of the other types, and he concludes that *extension of value expression* of variable is one of the *value extensions* of that variable, and *intension of value expression* of variable is one of the *value intensions* of that variable.⁵⁰ The analysis of the *variables of the type of sentence* is analogous to the previous one, which means that their *value extensions* are *truth-values*, and their *value intensions* are *propositions*.⁵¹ The last, but not less important, are the *individual variables* and their *value extensions* are *individual*, and their *value intensions* are *individual concepts*.⁵²

2.3. Extensional and Intensional Contexts and the Principles of Interchangeability

Important step is to regard *extensional* and *intensional contexts*, with respect to the *principles of interchangeability*, and Carnap's starting point is a situation when the expression, occurring within designator, is replaced by another one. If extension of the designator is not changed, then these two expressions are *interchangeable* within the designator, and if intension of the designator remains unchanged, the two expressions are *L-interchangeable* within the given designator. The context in which the condition of extensionality is fulfilled is *extensional context*, and in those cases in which this condition is not fulfilled, but the analogous one with respect to intension, the context is *intensional*. Taking the basic features of extensional and intensional context, Carnap concludes that:⁵³

* *sentence is extensional* with respect to expression occurring in it – expression occurs in sentence within the extensional context if it is *interchangeable* at this place with other *equivalent* expression;

* *a sentence is intensional* with respect to expression occurring in it – expression occurs in the intensional context, if the context is not extensional and the expression is *L-interchangeable* at this place with every other *L-equivalent* expression;

* *expression* occurring in sentence is *interchangeable* with another if the truth-value of sentence remains unchanged when the first expression is replaced by the second;

* *two expressions* are *L-interchangeable* if the intension of the sentence remains unchanged.

⁵⁰ Ibid., p. 45.

⁵¹ Ibid., 46-7.

⁵² Ibid.

⁵³ Ibid., p. 47-50.

So, employing the concepts of equivalence and L-equivalence Carnap makes distinction between three kinds of contexts: *extensional*, *intensional* and *the context which is neither extensional nor intensional* (the case of belief-sentences). In extensional context equivalent expressions may be interchanged *salva veritate*, while in intensional context L-equivalent expressions may be interchanged *salva L-veritate*. Accordingly, Carnap points out that the sentences of S_1 (containing ordinary connectives and quantifiers but no modal signs) are *extensional* and the sentences in S_2 (constructed out of modal signs) are *intensional*. Since S_1 has none but extensional context, there is no way to express the analytic character of sentence in S_1 , but it may be explained in M by pointing that the two predicates (contained in that sentence) are L-equivalent in S_1 . On the other hand, S_2 contains the modal operator 'necessary/N' defined by *state-description*. Taking in this way, S_1 can be considered as extensional object-language, S_2 as intensional object-language, and M as metalanguage.

On the previous definitions Carnap deduced the theorems known as the principles of interchangeability. The *first principle of interchangeability*⁵⁴ is concerned with relation between two sentences in S which are extensional with respect to the occurrence of their designators. It has three forms,⁵⁵ and Carnap explains that first form can be deduced from the definition of the extensionality of an expression, while other two follow from first by general definition of equivalence. According to the *second principle of interchangeability*⁵⁶ it holds that if two sentences are equivalent (in S), then the occurrence of the first designator within the first sentence is L-interchangeable, and hence interchangeable with corresponding designator in S .⁵⁷ In *extensional system* the equivalent expressions are interchangeable, and in *intensional system* they are L-interchangeable.

2.4. The Belief Sentences

The main issue here is the *context that is neither extensional nor intensional* and Carnap thought that it could be the case of the *sentences about belief*,⁵⁸ where the replacement of subsentence by L-equivalent one changes the truth-value and the intension of whole sentence. This kind of sentence has the usual form like „Petra believes that ...“, a sentence which contains *the psychological terms*. At first glance, the sentence seems clear and unproblematic, used and understood in everyday life without any difficulty. But, when we try to

⁵⁴ Ibid., p. 51.

⁵⁵ Ibid.

⁵⁶ Ibid., p. 52.

⁵⁷ Carnap points out that forms b. and c. of the second principle of interchangeability are possible only with help of the modal signs, only with respect to nonextensional language system.

⁵⁸ R. Carnap, *Meaning and Necessity*, p. 53-6.

analyze it from the logical point of view, it starts to be problematic. The most interesting questions are how to analyze the belief sentences, and are they about proposition, sentence, or something else? Situation like this is not possible in systems used before, in S_1 and S_2 . Every sentence in S_1 is extensional, and every sentence in S_2 is either extensional or intensional. In the purpose of further explanation Carnap has constructed the object language S_B similar to S_1 by its structure, except for containing the predicator '... believes that ...'. There are no specific rules except that the predicator 'believes that' has its ordinary meaning, and the main semantical concepts are 'true', 'L-true', 'equivalent' and 'L-equivalent'. He analyzed the two belief-sentences:⁵⁹

- a. 'Petra believes that D.' and b. 'Petra believes that D*.'

The possible answers to the question whether Petra believes what these sentences say or not, are either affirmative or negative. The affirmative answer leads to her *belief* and the negative to her *non-belief*. Carnap here distinguishes the two possibilities, one professing the belief and other when person is unable for any answer at all (neither for belief nor non-belief). In the first case he uses the L-true sentence for which Petra professes her belief, ('D' in sentence **a**), and regards it as *true*. In the second case, he uses L-true sentence for which Petra cannot profess neither her belief nor non-belief, ('D*' in sentence **b**), where D* is L-true but the sentence **b** itself is *false*. So, the result is that the two belief-sentences (**a** and **b**) have *different truth-values*, and hence they are *neither equivalent nor L-equivalent*. With respect to the interchangeability and L-interchangeability the occurrence of 'D' in sentence **a** is *not interchangeable/ L-interchangeable* with 'D*' ('D' and 'D*' are L-true, they are equivalent and L-equivalent). If we try to exam the first belief-sentence **a** with respect to its subsentence 'D', we can see that neither the *condition of extensionality* nor the *condition of intensionality are fulfilled*. On this ground Carnap concludes that the *belief-sentence a* is *neither extensional nor intensional* with respect to its subsentence 'D'. But, although subsentences 'D' and 'D*' have the same intension (L-true or necessary proposition), and the same extension (the truth-value 'truth'), their interchange transforms sentence **a** into sentence **b** (which does not have the same extension as **a**). In an attempt to provide the answers to those questions from the beginning we come across to Carnap's claim that the belief-sentence is about (*sub*)*sentence* and about *proposition*. He maintains that the belief sentence (like sentence **a** in previous example) must have a *stronger relation* to its subsentence ('D'), and something more in common with 'D' than the intension. The two sentences must be understood in the same way:

⁵⁹ Ibid.

they must be L-equivalent and they must consist of L-equivalents parts. Taking in this way, two sentences have the same *intensional structure*, which is the key concept of Carnap's analysis of the belief-sentences. The main idea is that if *two sentences are built in the same way* out of designators, such that any two corresponding designators are L-equivalent, or have the same intension, then two sentences are *intensionally isomorphic* (they have the *same intensional structure*). This relation Carnap also calls '*synonymous*'. The special interest is directed to the *analysis of the intensional structure* of designators, especially sentences. This analysis is semantical analysis, based on the semantical rules whose main purpose is to show in which way the given sentence is built up out of designators, and what are the intensions of these designators. Carnap explains that there is a **special requirement for the isomorphism of two expressions**, and it consists in the **analysis of both expressions down to the smallest subdesignators**, which has to lead to analogous or same results. He finds that it is possible to take all those expressions which serve as sentences, predicators, functors or individual expressions, as designators (no matters whether metalanguage *M* contains corresponding variables). He has introduced *M* because he wanted to compare the intensional structures of two expressions which belong to different language systems (namely to *S* and *M*). This should be possible only if the concept of L-equivalence is defined for the expressions of both languages in such a way that it fulfills the requirement „that an expression in *S* is L-equivalent to an expression in *S'* (or *M*) iff the semantical rules of *S* and *S'* together, without the use of any knowledge about extra-linguistic facts, suffice to show that the two expressions have the same intension“⁶⁰. This requirement presupposes that *L-equivalence* holds between *two individual constants* (if the rules of designations show that these two individual constants stand for the same individual), *two predicators* (if they apply to same individuals), *two functors* (if they assign the same value/s to same argument/s), *two sentences* (if they have the same truth-value, namely the two sentences belonging to two different systems are said to be *intensionally isomorphic* iff the L-equivalence of the corresponding signs is established) and between *variables* (this analysis is more complicated, and here Carnap defines *isomorphism with respect to the concept of matrix*: if the two matrices are built up in the same way out of corresponding expressions, which are either L-equivalent designators or matrices, then the intensional isomorphism of matrices holds).

On this ground Carnap has founded his definition of *intensional isomorphism* as relation between expressions stronger than L-equivalence, in order to deal with *the paradox of*

⁶⁰ Ibid., p. 57.

analysis. The paradox of analysis is a special case of Frege's puzzle known as *paradox of identity*. To explain this we have to go back to the classification of semantical system. As we know, some systems accept *no distinction between reference and meaning, extension and intension, sense and nominatum*. For such systems there is reference alone, while other admit this distinction but deny that having a meaning/intension involves an entity, and therefore deny the existence of expressions which refer to such entities. Systems of both these types are known as the *first-level semantical systems*. When system is more than first level, some entities must be meanings or intensions, and some entities serve both as extensions and as intensions. Carnap's method of extension and intension is *two-level semantical system*, which means that expressions refer to both extensions and intensions. But, according to other interpretation expressions (to which semantical method is directly applied) refer only to the one sort of entity. On either interpretation, **the method of extension and intension** admits entities on two semantics level (important difference between Carnap's system and Frege's method of the name-relation is that first system has two levels while second has infinitely many).

So, *the paradox of identity/the paradox of analysis* arises when the substitution of equivalent and L-equivalent expressions (in extensional and intensional contexts), alters the significance but not the truth-value of sentences in which they appear. On the other hand, the problem of belief-sentences and the antinomy of the name-relation arise when the substitution of equivalent and L-equivalent expressions may alter the truth-values of sentences in which they appear. Once the distinction between first and second level entities is admitted, it is quite possible to recognize the analogy between two paradoxes. If it is reasonable to postulate intensional entities to solve the paradox of identity, it is as reasonable to postulate *super-intensional*, or *third-level*, entities to solve the paradox of analysis. But, it seems difficult to justify appeal to the intensional isomorphism to solve the paradox of analysis. If the semantical analysis of intensional contexts demands recourse to intensional entities, then semantical analysis of belief-sentences postulate the super-intensional or third-level entities. But, on Carnap's account, intensional contexts and contexts provided by belief-sentences *are not the same*, since the former admits the substitution of L-equivalent expressions and the latter do not. Also, since the method of extension and intension is two-level system of semantics, it cannot treat the problem of belief-sentences by the analogy of modal sentences, but instead of it the concept of intensional isomorphism is used. The question is whether solution based on *intensional isomorphism* is adequate, since the problem of belief-sentences is putt over in object-language. What conclusion may be drawn? We may say that Carnap gives *no semantical analysis of belief sentences*, in the sense in which he gives semantical

analysis of intensional contexts. For intensional contexts, he established the rules for interchanging the expressions, based on semantic relations between expressions and entities. He applied his method of meaning analysis to the designators within intensional sentences, in order to show how the meanings of sentences are constituted out of the meaning of other expressions. In the case of belief sentences-analysis such semantical analysis is not provided. In this case the sentences are translated in other sentences, and to that translated sentences the semantical analysis may be applied. So, the analogy between intensional contexts and belief sentences raises the question: if only full semantical analysis is appropriate to intensional contexts, on what ground the similar treatment is denied for the belief sentences? Carnap's semantical system appeals to extensions and intensions as discrete categories of entities. The course of assimilating belief sentences to intensional contexts is not plausible because Carnap's treatment of intensional contexts is directed to the interpretation of language in which modalities and quantification are intermixed. His intensional entities depend on L-truth, L-truth depends on state-descriptions, and state-descriptions are constructed in purpose of semantical analysis for languages combining modalities and quantification. To Carnap, *relation of intensional isomorphism* represents a stronger meaning relation, since the identity of intension is not always adequate or sufficient. The important question is that of applications of the concept of intensional structure, and in order to explain its applications he compares it with *synonymity*, using it to give an extended interpretation of belief-sentences. If we ask for an exact translation of belief-sentence, then *we should require much more than agreement in the intensions of the sentences*, or their L-equivalence. Even in the case of restricted meaning, like designative or cognitive meaning, L-equivalence of sentences is not sufficient. The main request is that at least some of component designators are L-equivalent, or that the intensional structures are similar as much as possible. In this context, Carnap pays a special attention to Quine and Lewis' conceptions⁶¹ of synonymity. Quine's conception of synonymity does not employ L-equivalence, but it figures whenever we use the *method of indirect quotations*. He insists on *synonymous sentence* and on *reproduction of meaning*. Such synonymity is different from logical equivalence. Carnap objects that explication could not be found in semantics but in *pragmatics*, and according to Quine, synonymity requires a definition or a criterion in *psychological* and *linguistic terms*. Lewis' conception of synonymity shows great similarity to intensional isomorphism, and the main requirement was that two expressions (to be synonymous) must have the *same intension*, or to be equivalent in

⁶¹ Ibid., p. 56-9.

analytic meaning.⁶² Carnap points out that the notion of *equivalence in analytic meaning* is not sufficient for the analysis of belief-sentences. The interpretation of belief-sentences allows us to assert one and deny the other sentence, and according to Carnap we can do so without contradiction since two sentences have different intensional structures. Lewis' usage of the concept of *comprehension* (it presupposes nonfactual, possible things) is problematic because it requires a new and much more complicated language form. Within the logical framework of ordinary language, we cannot consistently apply the conception of impossible or possible non actual things. Carnap notices that Lewis emphasized rightly the difference between comprehension and extension, but not between comprehension and intension, and he offers the translation as solution maintaining that whatever is said in terms of comprehension can be translated in terms of intension (but, since they logically determine each other, there is no advantage in having both concepts).

3. The Method of the Name-Relation

3.1. The Name-Relation and its Principles

The *method of the name-relation* consists in regarding an expression as a *name* for concrete or abstract entity, and it is characterized by *name-relation* which holds between language expression and those entities (of which that expression is name). In Carnap's terminology, this relation is *semantical relation*, and various phrases have been proposed for expressing this relation:⁶³

- | | |
|---|--|
| 1. „ <i>x</i> is a name for <i>y</i> “, | 2. „ <i>x</i> denotes <i>y</i> “, |
| 3. „ <i>x</i> designates <i>y</i> “, | 4. „ <i>x</i> is a designation for <i>y</i> “, |
| 5. „ <i>x</i> signifies <i>y</i> “, | 6. „ <i>x</i> names <i>y</i> “. |

Carnap uses phrases like „*x* is a name for *y*“, and „*x* names *y*“, and instead of „entity named by expression *x*“ he uses „the *nominatum* of *x*“. Many logicians differ with respect to the kind of expressions which may be regarded as names. When three basic principles are fulfilled then the method of the name-relation is used, and these principles are known as *principles of the name-relation*.⁶⁴ The first is the *principle of univocality* which states that every expression used as name (in certain context) is a name of exactly one entity, and that entity is *nominatum* of expression. It follows that naming is function which assigns exactly

⁶² *ibid.*, p. 60.

⁶³ *Ibid.*, p. 97.

⁶⁴ *Ibid.*, p. 98.

one entity/*nominatum* to every expression of appropriate kind/*name*. The second is the *principle of subject matter* according to which sentence deals with *nominata of names* occurring in it, and *nominata* constitute the *subject matter of sentence*. The *principle of interchangeability* (or *substitutivity*) states that (form a) if two expressions name the same entity, then true sentence remains true when one expression is replaced by the other, or if two names name the same entity, then any true sentence remains true if the first name is replaced by the second. Second claim (form b) is that if an identity sentence is true, then the two argument expressions are interchangeable everywhere, which means that the identity sentence is true iff both argument expressions name the same entity.

Carnap gives some remarks about each principle. He points out that the *principle of univocality* has to be applied to well-constructed language without ambiguities, and that its fulfillment may be regarded as defining univocality in the sense of *nonambiguity*. This kind of language is artificially constructed system, where the ordinary ambiguities are eliminated in two ways: first, to assign only one of its usual meanings to an ambiguous word, and second, to replace it with several terms for several meanings. The *principle of subject matter* is sometimes used for making the third principle plausible, and if we accept the first two principles we can hardly reject the third. Regarding the *principle of interchangeability* it is important to notice that its form **b** involves the name-relation implicitly in the concept of *identity sign* or *identity sentence*. By definition of identity expression and identity sentence, we can see that form **b** follows from **a**, and **b** is plausible just like **a** is. The interchangeability of synonymous expressions (those which name the same entity) follows from semantical and syntactical rules of equivalence.

In third chapter of his *Meaning and Necessity*, Carnap represents basic versions of the method of the name-relation, introducing Frege and Quine's analyses. In Frege's analysis, the most important is his distinction between '*nominatum*' and '*sense*', and his formulation of the principle of interchangeability (in its first form) according to which „*the truth-value of sentence remains unchanged if we replace an expression in it by one which names the same entity*“.⁶⁵ Quine uses terms '*designates*' and '*designatum*' for '*names*' and '*nominatum*', and formulates the principle of interchangeability as the *principle of substitutivity* (the second form) which states that „*given a true statement of identity, one of its two terms may be substituted for the other in any true statement and the result will be true.*”⁶⁶

⁶⁵ Ibid., p. 99.

⁶⁶ Ibid.

Carnap gives some remarks regarding these principles trying to present certain analogues with his concept of *extension*. The analogy to the *principle of univocality* holds and *every designator has exactly one extension*, and the analogue to the *principle of subject matter* holds too but with some restrictions: sentence containing designator may be interpreted as speaking about extension and intension of the designator. Difference emerges with respect to the *principle of interchangeability*: for extensions only the first principle of interchangeability holds, in its restricted form. According to that interpretation, if two expressions have the same extension (if they are equivalent) then they are interchangeable in extensional contexts. On the contrary, the second form of the principle speaks about identity. The point is that, on the basis of the method of extension and intension we cannot simply speak of identity. What we have to do is to make *distinction between identity of extension and identity of intension*, equivalence and L-equivalence (meaning that Carnap has two principles on disposal, one for equivalence and the other for L-equivalence).

3.2. The Problem of Ambiguity in the Method of the Name-Relation

It is generally assumed that if we understand an expression then we (may) know to what kind of entities its nominatum belongs and which entity is the nominatum. In other cases the factual knowledge is required for this. If we understand language then we know that certain word is name of certain thing. The understanding of language and names in it, with all relevant factual knowledge, implies that there could be no doubt as to the nominatum of names. But, in Carnap's opinion this is not always the case, explaining this by the example of „two logicians“⁶⁷. His solution consists in pointing out that it does not really matter whether the two logicians say that 'the sentence means that Rome belongs to the class Large' or 'the sentence means that Rome has the property Large'. These sentences are both true, and differ in their formulation. But, the point is that the controversy concerning the nominatum of 'gross' (large) still remains unsolved: the nominatum is the *class* Large, or the *property* Large. If both logicians agree in affirming the principles of the method of the name-relation, then they must agree, according to the principle of univocality, that 'gross' (in German language) can have only one nominatum. If they agree that the class Large is not the same as the property Large, then they must accept the distinction between the property and the corresponding class.

There are a several suggestions which Carnap regards. The *first* suggestion is that their controversy is due merely to the choice of an unsuitable object language, the *second* is that

⁶⁷ Ibid., p. 105-6.

natural language like G, even after the elimination of an obvious ambiguities, is not precise enough for univocal semantical analysis, and the *third* is that two logicians have to restrict their analysis to well-constructed symbolic system with exact rules. The main problem here is not that controversy is caused by the imperfections of the given language. Carnap concludes *first* that the controversy is not an instance of the well-known multiplicity of interpretations, and for any given logical system there are several interpretations, and all of them are in accordance with the rules of the system itself. *Second*, two logicians actually apply the same interpretation to their object language, no matter to different semantical terms used for describing one and the same interpretation, and *third*, two logicians apply the same interpretation to different languages which means that (to any given sentences) they attribute the same meaning, or the same truth-condition. The problem is that two logicians maintain different conceptions with respect to question what are the nominata of the names occurring. Carnap takes that this shows that the method of the name-relation involves ambiguity, and that term 'is a name of' is ambiguous (several logicians may use it in different ways).

In the same way, for the designator of another kind either its extension or its intension may be taken as its nominatum. This shows that there are more than two ways for using the method of the name-relation. The multiplicity of usage is increased by the fact that some logicians take some predicators as names of classes, and other as names of properties. Some of them take the same expression as a name of extension in one context, and as a name of intension in another. The multiplicity of using of the method of the name-relation shows that there are many different senses in which the term 'name' can be used.

Many systems may have different names for properties and corresponding classes. Carnap reminds that in order to speak about intension and corresponding extension, the method of extension and intension *requires only one expression*, while the method of the name-relation *would require two expressions* which lead to *unnecessary duplication in symbolism*. This unnecessary duplication can best be explained in the case of predicators. In the previous analysis Carnap did show that his method of extension and intension needs only one predicator to speak about both, property and corresponding class. To do the same the method of the name-relation needs two different expressions: *property name* and *class name*. Carnap explains that at the beginning there was just different procedure of describing the semantical features to given language systems. The *method of the name-relation* describes it in terms of nominata, and the *method of extension and intension* in terms of extensions and intensions. We may think that both methods are neutral with respect to the language structure,

and that either method is as applicable to any system as the other. In that case, the choice of one or other method for the semantical analysis would not have any effect upon the choice of structure. In Carnap's view this is not the case, and he points that according to the *method of the name-relation* the two expressions are said to have *different nominata*, and exactly this is the justification to incorporate both expressions into the system. In the manner of Carnap's method the two expressions are said to have the *same extension and the same intension* and inclusion of both concepts would be just unnecessary duplication. This means that it is possible to construct the system that contains, instead of these two expressions, only one expression. But, speaking of choice of semantical method and form of language, the preference toward the language structure may influence the preference for one of two semantical methods. Carnap notices that if we take language with only one kind of predicator to be effective as much as language with two kinds (but much simpler and more convenient), then the method of the name-relation must be regarded as inadequate.

By the method of the name relation, especially by the principle of subject matter, the duplication is regarded as necessary, since otherwise we could not speak both – about classes and about properties. The analogous situation is with *variables* as well. When we speak about *particular* entities, the names are used (then method of the name-relation leads to the class names and the property names), but when we speak about entities of some kind in *general* the variables are used (then the method leads to the introduction of two kinds of predicator variables for the same type). The values of variables of the first kind are classes, and the values of variables of the second are properties. From the point of view of *the method of extension and intension* this duplication is useless.

3.3. *Distinction between Nominatum and Sense*

Distinction between *nominatum* and *sense* of expression is the starting point here, and in order to make clear these two terms Carnap gives the list of basic concepts:⁶⁸ **Ausdrücken** or *express*, **Sinn** or *sense, meaning, or connotation*, **bezeichnen** or *to be a name of, to name*, **Bedeutung** or *nominatum*, **Begriff** or *property*, **Gedanke** or *proposition*, **gewöhnlich** or *ordinary*, **ungerade** or *oblique*, **Gegenstand** or *object*, **Wertverlauf** or *value distribution*, and **Behauptungssatz** or *(declarative) sentence*. His aim was to explain the distinction between *nominatum* and *sense*, and compare it with that between *extension* and *intension*. The main purpose of Frege's work Carnap regards as complex task divided in two stages: *first* stage is semantical analysis of certain kinds of expressions in ordinary word language, and

⁶⁸ Ibid., p. 118., footnote 21.

second is proposing, examination and applying semantical concepts as instruments for this analysis. Carnap took Frege's conception as very important for logical analysis. Starting with his famous example of 'morning star/evening star', Carnap reminds that certain expressions are *names of objects* (abstract and concrete) and points out the distinction between *nominatum* of expression and its *sense*, explaining the way in which nominatum is given by expression. He illustrates this by example that

a. two expressions 'the morning star' and 'the evening star' *have the same nominatum*⁶⁹.

He accepts that because both expressions are names of the same thing/planet, for which the ground can be found in the well known astronomical fact, and from this we may deduce

b. the true statement „The morning star is the same as the evening star“. But, we may also conclude that

c. the expressions 'the morning star' and 'the evening star' do not have the same sense, and the reason is because two expressions refer to their common nominatum (planet) but in different ways. If we understand language and if we have knowledge of astronomy we can grasp the sense of the expressions: we know that the sense of 'the morning star' is the same as that of the phrase 'the body which sometimes appears in the morning before sunrise in the eastern sky as a brightly shining point'. This means that nominatum is not given by sense, and in order to conclude that two expressions have the same nominatum much more is required than just to understand the sense of expressions. The same holds in **the case of sentence**, according to Frege in (declarative) sentence we express a proposition/'*Gedanke*', and the question is whether the proposition expressed by sentence is its sense or its nominatum. Frege arrives at the conclusion that:

d. the (ordinary) *sense* of sentence is the proposition expressed by it.

e. the (ordinary) *nominatum* of sentence is its truth-value.⁷⁰ These statements hold for ordinary cases and isolated sentence (one which is not a part of a larger sentence). To Carnap these two statements are not just certain conventions, or a part of definitions of 'sense' and 'nominatum', and it is not so clear what is to be understood by these terms. The reason for his explanations he finds in *Frege's principles of interchangeability*. There are two principles and *first principle* states that if two names have the same nominatum, then two expressions have the same nominatum, meaning that *the nominatum of the whole expression is a function of the nominata of the names occurring in it*. *Second principle* states that if two names have the same sense, then two expressions have the same sense, meaning that *the sense of the whole*

⁶⁹ Ibid., p. 119.

⁷⁰ *ibid.*

expression is a function of the senses of the names occurring in it. Frege's conclusion was that proposition expressed by sentence must be either its nominatum or its sense. Two sentences have the same truth-value and the truth-value may be regarded as the common nominatum. The most important application of these two principles Carnap recognizes in the case of sentence referring to them as *Frege's principles of interchangeability within sentences*. In accordance to *first principle* if two names have the same nominatum, then two sentences have the same truth-value, and in Carnap's terminology names which have the same nominatum are *interchangeable* with one another. According to the *second principle*, if two names have the same sense, then two expressions express the same proposition, and in Carnap's terminology names which have the same sense are *L-interchangeable* with one another. Carnap concludes that Frege's principles lead to resulted statements d. and e. (for ordinary cases and isolated sentences), but to the exception as well known as ***oblique context***⁷¹. Carnap explains it by example of the occurrence of false sentence (i) „the planetary orbits are circles“ within the *oblique context* (ii) „Copernicus asserts that the planetary orbits are circles.“⁷² The problem involved here would be the same if instead term 'asserts' the term 'believes' occurs. According to Frege the *ordinary nominatum* of (i) [the nominatum which sentence has when occurring either isolated or in ordinary/nonoblique context] is its truth-value (falsity in this case). On the other hand, the *ordinary sense* of (i) is the proposition that the planetary orbits are circles. Frege concludes that sentence (i) within the oblique context (ii) does not have its ordinary nominatum but its *oblique nominatum*, and does not have its ordinary sense but its *oblique sense*. It follows that the ***oblique nominatum of name***⁷³ is the same as its ordinary sense, and that the ***oblique nominatum of sentence***⁷⁴ is not its truth-value but the proposition which is its ordinary sense.

3.4. Nominatum and Sense: Extension and Intension

Both pairs of concepts, Frege's nominatum/sense and Carnap's extension/intension, are intended to serve for the purposes of semantical meaning analysis, and they may be regarded as representing the two components of meaning. This means that *sense* and *intension* refer to the *meaning in strict sense* (as in the case when we understand an expression without knowing the facts). On the other hand, the *nominatum* and *extension* refer to the *application*

⁷¹ The oblique context is about the same as a nonextensional context in Carnap's terminology. For this purpose see the definition concerning the method of extension and intension.

⁷² Rudolf Carnap, *Meaning and Necessity*, p. 123

⁷³ Ibid.

⁷⁴ Ibid.

of the expression (depending upon the facts). Difference between these two methods consists in fact that extension and intension, as opposite to nominatum and sense, are *independent of the context*. This means that an expression, in a well-constructed language system, always has the same extension and the same intension. On the other hand, expression in some contexts has its ordinary nominatum and its ordinary sense, while in other its oblique nominatum and its oblique sense. Generally, this analysis can be divided in two steps. First step is *comparison of extension of expression with its ordinary nominatum*. It looks like these concepts coincide, but there is one exception with respect to *predicator*, and it seems that Frege does not explain how his concepts are to be applied. With respect to *sentence*, its truth-value is both ordinary nominatum and extension, while with respect to *individual expression* ordinary nominatum and extension is the individual. This leads to conclusion that *for any expression, its ordinary nominatum (in Frege's method) is the same as its extension (in Carnap's method)*.⁷⁵ Second step was to *compare intension of expression with its ordinary sense*. But, it is difficult to see clearly what constitutes the ordinary sense in Frege's method, and this is due to the lack of the *condition of identity of sense*. Carnap has presupposed that Frege could agree to take L-equivalence as that condition. In that case, for *sentence* its ordinary sense is the expressed proposition, hence it is the same as its intension. For the *predicator* of degree one, its ordinary sense is the property in question, and its intension is the same. It seems reasonable to assume that what Frege means by sense (of individual expression) is about the same to Carnap's individual concept. So, Carnap presupposes that *for any expression, its ordinary sense (in Frege's method) is the same as its intension (in Carnap's method)*.⁷⁶

The final conclusion is that Carnap's two concepts coincide with those of Frege, differences arise only with respect to expressions in *oblique context*. Carnap's concepts lead to same entities while Frege's to different entities. According to Carnap, this difference is a consequence of Frege's general principles: we speak about difference between explicandum which Frege takes for base of his nominatum/sense distinction, and that which Carnap takes for his extension/intension distinction. There are two questions here, two practical aims, but the general aim is the same, namely the construction of pair of concepts sufficient and suitable as instruments for semantical analysis. The specific aims are different: both of them try to achieve the general aim by explication of his pair of concepts. There is no contradiction between these two theories since their main concepts are different, and since theories are not

⁷⁵ *ibid.*

⁷⁶ *ibid.*, p. 126.

incompatible it would be possible to use both simultaneously. But, if the simultaneous use of both seems unnecessarily complicated, then beside the theoretical compatibility there is practical incompatibility. The question is which of the two theories is more fruitful for the purpose for which both are proposed. The conflict might appear when logicians inclined to Frege's concepts construct a logical system that it contains different expressions for classes and properties, while those inclined to Carnap's concepts would not do so.

3.5. *The Antinomy of the Name-Relation*

As we have seen, the three main principles of the method of the name-relation seem quite plausible. This holds for both forms of the principle of interchangeability, one using the concept of name-relation and other using the concept of identity. But, if we apply the principle of interchangeability in either form to nonextensional contexts, we arrive at contradiction which Carnap calls the *antinomy of the name-relation*⁷⁷. The antinomy of the name-relation can be constructed in two forms. The first one uses the first form of the principle of interchangeability (one using the name-relation), and second uses the second form (or one using the concept of identity). The second form of the antinomy may also be called *antinomy of identity*, or *antinomy of identical nominata*, or just *antinomy of synonymity*. Here, synonymity should be understood not in the sense of 'intensionally isomorphic' but as '*having the same nominatum*'. The third principle of the name-relation permits the replacement of name with another name of the same entity. But, although this principle seems quite plausible, it is not always valid. Carnap reminds that Frege was the first who has pointed out to fact that the principle of interchangeability, if applied to the ordinary nominata of names, does not hold for oblique contexts. Despite the fact that Frege's formulation was not presented in terms of contradiction, Carnap concludes that his result constitutes the base of *the antinomy of the name-relation*. Paradoxical character of this situation was first seen by Russell, who regarded the name-relation as the theory of denoting, and was mainly interested in the second form of the antinomy, explaining it with respect to interchange of individual expressions. According to him, the principle of interchangeability may be formulated as follows: „if a is identical with b, whatever is true of one is true of other, and either may be substituted for the other in any proposition without altering the truth or falsehood of that proposition.”⁷⁸

⁷⁷ Ibid. His choice for taking this particular term Carnap explains by fact that the method of the name-relation is responsible for this antinomy. Others, who regard that the source of the difficulty in question lies for example in the use of modal contexts or, more generally, in intensional context or, still more generally, in oblique contexts, may call it the antinomy of modality, or antinomy of intensionality, or antinomy of obliquity.

⁷⁸ Ibid.

It became clear that the principle of interchangeability, in its both forms, suffers from serious antinomies, which acknowledges Carnap's initial thesis about the antinomy of the name-relation. He pointed out that logical antinomies are characterized by fact that there are two methods of reasoning. The issue is that, although both of them are plausible and in accordance with customary ways of thinking, they lead to contradictory conclusions. Any kind of solution of the antinomy, in Carnap's opinion, consists in changing the reasoning procedure. What he meant is that at least one of the assumptions (or rules of the reasoning procedure) must be restricted so that it is no longer possible to derive the two incompatible conclusions. A more radical step is that certain forms of sentences (previously regarded as meaningful and harmless) have to be refuted. But, different solutions may be found and it is a matter of theoretical investigation to discover the consequences to which each solution leads. The question which solutions we should choose (to construct a language system) is a practical decision, but still influenced by the result of the theoretical investigation.

4. Metalanguage, Semantics and Logic of Modalities

4.1. Object- and meta-language

To deal with *metalanguage* and with question *whether complete semantical description of system can be formulated in metalanguage* we have to be familiar with *extension* and *intension*. These two notions, or rather distinction between extension and intension, represent the starting point of Carnap's method of extension and intension, which he as a method of semantical meaning analysis (or semantical analysis of meaning) applicable to the specific kind of expressions of special semantical system S (S_1 , S_2 and S_3). A specific kind of expression considered are *designators* and basic concepts are *truth/falsity*, *L-truth/falsity* (or *logical truth/falsity* of sentences), *material* and *logical equivalence* (applied on individual expressions, as well as on predicators).⁷⁹

The next step is the analysis of the method of the name-relation, and in Carnap's terminology it is *semantical relation*. This method is important for the question whether metalanguage (M'), or any other language, can possibly be *neutral*. In trying to find a suitable

⁷⁹ Two statements are *materially equivalent* provided that they have the same truth-value, and *logically equivalent* provided each can be deduced from the other. Two sentences/words are equivalent in meaning provided they can be substituted for each other in any context without altering the meaning of that context. In the truth-functional logic, two statements are logically equivalent if they can never have truth-values different from each other. In this sense of 'logically equivalent' all tautologies are equivalent to each other and all contradictions are equivalent to each other.

method for the semantical analysis of meaning, Carnap explains important distinction between symbolic language system S_I , which serves as *object language* and semantical *metalanguage* M .

Carnap takes language as a system of sounds, or a habit of producing the sounds by the speaking organs to communicate with others. Instead of speech sounds, other movements are sometimes produced for the same purpose. The crucial notion in this rough description is *system*, and Carnap emphasizes that language is a system of sounds organized according to certain *rules*. The heterogeneous sets of sounds cannot constitute a language, unless they bear the explicit relations to each other. The *rules of language* describe what these relations are, which sounds bear such-and-such relation to other sounds, tell us how certain sounds (sequences of sounds) are combined to form longer phrases or sentences, etc. On the other hand, *metalanguage*, in formal semantics⁸⁰, is language used to describe another (*object*) language. *Object language* is the object of investigation, described or analyzed/formulated for specific purposes, while *metalanguage* is language in which the results of this investigation are formulated. Metalanguage is used to *talk about the object language*, while object language is used to talk about objects. On some occasions we may wish to talk about metalanguage itself, and we should ordinarily do that in meta-metalanguage. The fundamental importance of this distinction (distinction between object language and metalanguage) is in avoiding the semantical antinomies. The object language may be either *natural* or *formal*, and both are *language-systems*. The grammatical rules of natural language are empirical generalizations describing actual linguistic usage or behavior. It may be said that *natural language* can be identified with the totality of its grammatical rules. On the contrary, the rules of *formalized language* are not empirical generalizations of actual linguistic behavior, but stipulations laid down explicitly for specific purposes established by logician or methodologist. Formalized language-systems are much simpler than natural languages, their grammatical properties are determined by *fiat* rather than by empirical investigation. Formalized language is more important for philosophical logician than natural languages, especially because they exhibit

⁸⁰ *Formal semantic* is a study of the interpretations of formal languages. Formal language can be defined apart from any interpretation, and this is done by specifying a set of its symbols and a set of formation rules that determine which strings of symbols are grammatical or well formed. When rules of inference and transformation rules are added, and certain sentences are designated as axioms, a logical system is formed. An interpretation of formal language is assignment of meanings to its symbols and truth conditions to its sentences. Distinction is made between *standard* and *non-standard* interpretation of formal language. In constructing and interpreting a formal language we use language already known to us, and that language becomes our metalanguage, used for talking about formal (or object) language. Theorems proven within the object language must be distinguished from those proven in metalanguage (metatheorems). One of the most important goals of semantical theory of formal language is to characterize the consequence relation (expressed in that language) and to prove semantical metatheorems for that relation.

certain logical structure. *Carnap's object languages are always formalized language-systems, while his metalanguages are natural languages supplemented by symbols and expressions for higher clarity and explicitness.*

The *rules of natural and formalized language-systems* are divided in three kinds: *syntactical* or grammatical, *semantical*, and *pragmatical* rules (rules of use). Corresponding to these three kinds of rules, we recognize syntax, semantics, and pragmatics, which exhaust the formal study of language, together they constitute *semiotic*. *Syntax* focuses its interest on signs/expressions of language and their inner relations. The *pure syntax* is syntactical analysis of formalized language-system, and *descriptive syntax* is concerned with natural language, and to Carnap it is empirical science. *Semantics* presupposes syntax, and it is concerned not only with expressions and their interrelations, but with objects that signs/expressions denote/designate (similarly, we may distinguish *pure* and *descriptive semantic*). *Pragmatics* puts reference not only on signs and what they denote, but on language user as well (pragmatics contains semantics just as semantics contains syntax, and we distinguish *pure* and *descriptive pragmatic*). Since Carnap's object languages are always formalized language-systems, the main accent is on *pure syntax* and *pure semantics*. Within the context of pure syntax and pure semantics we distinguish *special* and *general syntax/semantics*. In special syntax/semantics we are concerned with specific object language, and in general syntax/semantics with the features of all object languages or all object languages of such and such a kind. His discussion Carnap starts with *syntax* and main syntactical notions, maintaining that the smallest units of language-system are *signs*, and sequences of these signs are *expressions*. Once the ultimate units are determined and decided upon, the expressions are taken to be any finite sequences of them. All utterances in language are to be treated as being of linear form, which provides the specification of the positions of signs in expression by enumeration.⁸¹ The fundamental syntactical notion is the operation of *concatenation*⁸², the operation of forming the sequences of signs (by the constituent signs or constituent sub-sequences). Carnap notices that there are several ways of handling the concatenation within the syntax, and three of them are the most important. The first is *the method of Tarski*⁸³ in which concatenation is taken as syntactical primitive, and axioms are laid down characterizing explicitly this notion. Second is *Gödel's*

⁸¹ According to Carnap, a spoken utterance in one of the ordinary languages is a temporal series of sounds, while a written utterance consists of marks ordered in lines.

⁸² Concatenation is typical empiricist model, in which thought is considered to be a chain/concatenation of ideas. In syntax concatenation is understood as a special operation which could be associative, formed of atomic or complex expression. See: Richard Martin, *On Carnap's Conception of Semantics*, in: ed. P. A. Schilpp, *The Philosophy of Rudolf Carnap*, The Library of Living Philosophers, Vol. XI, Cambridge University Press 1978, p. 351-384

⁸³ *Ibid.*

*method*⁸⁴ in which concatenation is handled as arithmetical operation, which means that the syntactical axioms become statements of arithmetic, and third is *the sequence method*⁸⁵ in which concatenation is defined in terms of sequences of primitive signs, and basic properties of concatenation are forthcoming as properties of sequences. There are different ways of formalizing syntax on the basis of any of these methods, depending upon the kind of logic presupposed. Any formalized theory must contain basic logic as its part (the first-order logic, second-order logic). If we want *to formalize syntax on the base of Tarski's method* the underlying logic may be second- or higher-order logic (the axioms of concatenation are analytic or logically true, or valid formulae of metalanguage). If we presuppose *Gödel's method of arithmetizing syntax* the theory of integres is presumed and formalized as branch of logic, and if *the sequence method is employed* we may use any way of formalizing arithmetic. In Carnap's writings it is not quite clear which method of handling concatenation is presupposed, but it is presumably the sequence method. Once the method of treating concatenation is decided upon, the remaining notions of syntax are definable, and we can define *term* and *variable* as concatenation of any kind, *formula* or *sentence* by recursion, *axioms* as formulae, *expression* as logical consequence of (derivable or provable from) other expression, *proof* and *theorem* by recursion, etc. The conclusion is that the various laws governing all these notions are provable from the underlying laws concerning concatenation, and thus the whole syntax of language comes out of the concatenation theory presupposed. In Carnap's words, a *pure syntax* deals with syntactical systems or calculus (e.g. *K*), which consist of rules that define syntactical concepts (e.g. 'sentence in *K*', 'provable in *K*', 'derivable in *K*', etc.), containing analytic sentences of metalanguage which follow from these definitions.

So, distinction between object language and metalanguage presupposes semantic analysis (or analysis of semantical system). Semantical system is completely determined by certain rules, which determine necessary and sufficient truth-condition for every sentence of the system. In this way the sentences are interpreted by the rules and made understandable. To understand a sentence, to know what is asserted by it, is the same as to know under what conditions sentence is (or would be) true. So, the rules determine the *meaning* or *sense* of the sentences, and truth and falsity are called the truth-values of sentences. To know the truth-condition of sentence is much less than to know its truth-value, but it is starting point for finding out its truth-value. Carnap uses 'rule' in the sense of '*definitional abbreviation*', and rule stipulates the conditions under which given word is used. But, 'rule' is also used by

⁸⁴ Ibid.

⁸⁵ Ibid.

logicians in the sense of the rule of inference, or in the sense of statement directly stipulating axioms (known as meta-axioms). The rules of inference define the syntactical notion of *logical consequence*, while meta-axioms define the notion of axiom. The *semantical rules* of language are definitions of semantical terms as applied to expressions. But, not only syntactical laws are analytic, the laws of *pure semantics* are analytic and without factual content. As Carnap has noticed, the rules of semantical system constitute a definition of semantical concepts with respect to given system ('designation in S ', 'true in S '), which means that pure semantics consists of these definitions and their consequences, and any axiom needed for semantics must be regarded as analytic. The aim of formal semantic theory is to provide an axiomatic or systematic theory of meaning for object language. The metalanguage is used to specify the object language's symbols and formation rules, which determine its grammatical sentences (well-formed formulas), and to assign the meanings (interpretations) to these sentences. For example, in an *extensional semantics* the metalanguage is used to assign denotations to singular terms, extensions to the general terms, and truth conditions to sentences.

Although distinction between meta- and object language must be maintained, in practice we can use language to talk about expressions in the very same language. Speaking in Carnap's terms, we can shift from *material* to *formal mode*.⁸⁶ Carnap's distinction on material and formal mode corresponds to the *use-mention distinction*. This distinction presupposes the two ways in which terms enter into discourse: terms are *used* when they refer to, or assert something, and terms are *mentioned* when they are exhibited for consideration of their properties as terms. *Material mode* corresponds to the *use of term* (and hence to *object language*) and *formal mode* to the *mention of term* (and hence to *metalanguage*). Distinction on formal and material mode is important because there are fallacies of reasoning based on use-mention confusions.

Further, Carnap determines the basic characteristics of object language S and metalanguage M , and his main goal was to determine the role of variables in S . If S is given, then M , intended for semantical analysis of S , must be adequate and rich enough in relation to S . This means that M must contain variables whose ranges of values cover those of all variables in S . Carnap presupposed that metalanguage M enables us to speak in general terms about extensions and intensions of predicators, sentences and individual expressions of S . His suggestion is that object language S should contain *individual variables* as well as those of the other types. With respect to the *predicator* he distinguishes its *extension* (class 'human') and its *intension* (property 'human'). He wants to point out that the sentence of S can be translated

⁸⁶ See R. Carnap, *Philosophy and Logical Syntax*, ed. London: Kegan Paul, Trench, Trubner and Co. Ltd., Broadway House Carter Lane E. C., 1935, p. 64-8.

into *M* in many different ways. In the translation-procedure we may use either expression 'human', phrase 'the class human', or phrase 'the property human'. It seems that he speaks about two kinds of entities in each type, extensions and intensions, classes and properties. This leads to the main problem of *the duplication of expressions*, or the apparent *duplication of entities*, and Carnap's aim was to find out is it possible to define one kind of entity in terms of the other, and does the elimination of the duplication of expressions presuppose the elimination of the duplication of entities.

M is part of English language, modified and supplemented, and it contains translations of sentences/ expressions of object language, names or descriptions of those expressions, and special semantical terms known as F-terms and L-terms. Question whether we speak of two different kinds of entities, or it is just distinction between two ways of speaking Carnap takes as very important, since his semantics for metalanguage is not supposed to be based on assumption that there are entities of all these kinds. The most convenient way to deal with this problem is to demonstrate that the number of apparent entities can be reduced. It seems that the apparent duplication of entities is just a duplication of terminology. The solution is the construction of new way of speaking *which would avoid the terminological split into extensions and intensions*. Carnap held that this solution presupposes the introduction of terms for speaking in more general way, not only about things but about entities of higher levels (class and properties). But, is it necessary to admit both kinds of entities (classes and properties)? Does it mean that terms of one kind are definable in the terms of other? Would it be better to take properties as primitive and define classes in terms of properties, or to take classes as primitive and define properties in terms of classes? Carnap's answer proposes four methods which take properties as primitive and define class expressions in terms of property expressions:⁸⁷ conception of extensions as L-determinate intensions, the method of Russell's contextual definition of classes in terms of properties, a modified version of Russell's contextual definition, and the method which uses property expressions themselves as class expressions. These four methods can be used for the definition of extensions of any kind in terms of intensions. Carnap emphasizes that these methods are applied in symbolic object languages, word language, and metalanguage as well. In his object languages there is no need for class expressions as additional to already existing property expressions, while in *M* he disposes with phrases of both forms ('the class Human' and 'the property Human'). Carnap maintains that *class* correspond to (it is definable in term of) *property*, *truth-value* to *proposition*, and

⁸⁷ R. Carnap, *Meaning and Necessity*, p.146-7.

individual to individual concept.⁸⁸ The reasons for Carnap's reduction lay down in common opinion that it is possible to define classes by properties, while the opposite is hardly possible. The plausible justification Carnap finds in the fact that property determines its class uniquely, while many properties may correspond to one class.

4.2. The Neutral Metalanguage M' and Its Semantics

His discussion about the reduction of entities shows that it is possible to construct language systems with only one kind of expressions. To prove this thesis Carnap uses rules and definitions of his method of extension and intension, showing how notation in object language can be simplified by using his method: instead to use one expression as name of property and other as name for corresponding class, it is sufficient to use just one expression. The used expression has to be *neutral* in the sense that it is regarded neither as expression whose intension is property nor as expression whose extension is class. Language, or metalanguage, constructed out of such neutral expressions is called *neutral language*, or *neutral metalanguage*. In comparison to already existed metalanguage M , the neutral metalanguage M' contains only neutral expressions (expression 'Human'). By using only neutral phrase, which contains neither the word 'class' nor the word 'property', M' in fact results from M by eliminating the terms 'class', 'property', and alike, in favor to neutral formulations. The neutral term 'Human' in M' is at once *class expression* and *property expression*. Carnap states that problem arises in the context of translation of identity sentences in M' , since the *identity is different for extensions and intensions*. He concludes that the neutral formulation cannot speak about identity, which means that identity phrases like 'is identical with' or 'is the same as', are not admissible in M' .

Trying to overcome difficulty regarding the identity relation, and to explain the translation of identity sentences in M' , Carnap uses terms '*equivalent*' and '*L-equivalent*' in their nonsemantical use (as they stand for relations not between designators but between intensions). It was already shown that identity of extensions coincides with equivalence of intensions, and identity of intensions with L-equivalence of intensions.⁸⁹ This means that terms equivalent and L-equivalent can be used in the context of neutral phrases, they are *neutral entities*. To Carnap, the translation of identity sentences in M' represents no difficulty now: according to given rules, *sentence stating identity of extension* is to be translated as one stating *equivalence of neutral entities*, and *sentence stating identity of intension* as one stating

⁸⁸ Ibid., p. 151.

⁸⁹ R. Carnap, *Meaning and Necessity*, 1955, p. 25.

L-equivalence of neutral entities. Identity sentences speaking of predicator are *semantical sentences* in metalanguage *M*, and contain references to neutral metalanguage *M'*, while identity sentences not speaking but using them to speak about nonlinguistic entities are different, and they are not semantical. Nonsemantical sentences belong to nonsemantical *M* and nonsemantical part of *M'* (part in which sentences of object languages can be translated). The neutral formulation has to be *customary and grammatically correct*, e.g. the simple formulation 'Scott is human'⁹⁰ can be grammatically incorrect depending whether it occurs as grammatical subject or as a part of larger sentence, while complex formulation like 'That Scott is human is *equivalent* to that Scott is a featherless biped'⁹¹ may seem a little bit awkward. By this example Carnap shows that the use of 'equivalent' and L-equivalent' (as nonsemantical terms standing between sentences) is not in accordance with ordinary grammar and not customary. The more customary formulations in metalanguage *M* like 'the proposition', or 'the truth-value', are not possible in *M'* because they are not neutral and there is no customary neutral noun. Anyway, the translation of simple sentences, atomic sentences, involves no difficulty, because in this case the translation corresponds to the customary formulation, and grammatical correctness is not violated. The disadvantage of the formulation which is customary and grammatically correct, is because it is applicable only to sentences but not to other designators.

In the light of these considerations, Carnap emphasizes that the neutral formulation (e.g. 'Scott is human') replaces both the neutral sentences and the non-neutral phrases (e.g. 'the truth-value that Scott is human' and 'the proposition that Scott is human') in *M*. So, it must be admitted that the neutrality is not quite symmetrical, and the interesting question is whether designators in *M'* are correctly described as neutral, or whether they are just names of intensions. Since this is the question of translation from *M* in *M'* the rules of translations are presupposed:⁹²

- TR 1. in all contexts, except in the context of identity sentences, class and property expressions are translatable by the corresponding neutral expressions;
- TR 2. sentence stating the identity of classes is translatable into sentence stating the *equivalence* of the corresponding neutral entities;
- TR 3. sentence stating the identity of properties is translatable into sentence stating the *L-equivalence* of the corresponding neutral entities.

⁹⁰ Ibid., p. 156.

⁹¹ Ibid.

⁹² Ibid., p. 158-9.

It is obvious that every designators have intension and extension in M' , meaning that they are neutral in M' . All distinctions made in M still exist in M' , formulated in different but simple way. In fact, all non-neutral formulations in M (e.g. class, properties, individual, individual concept, truth-value, and proposition) could be reintroduced into M' by contextual definitions. Thus, M' is not poorer in means of expression than M , in M' the *neutral variables* are used, whose value-extensions are classes and value-intensions are properties. During the further analysis of whether the formulation of semantics is possible in M' Carnap points out that the two new relations (holding between neutral entity and predicator) are needed: the first relation is *extensional* and second is *intensional*. The *first relation* is relation of *designation*⁹³, which could be regarded as the formulation of the rule of designation (in M') for S_1 . The *second relation* is relation of *L-designation*.⁹⁴ *Relation of designation* in M' corresponds to *relation between designator and its extension* in M , and *relation of L-designation* in M' corresponds to *relation between designator and its intension* in M . The main purpose of this explanation is to show how semantical sentences in M can be translated into neutral formulations in M' .⁹⁵

The general conclusion we may draw is that method used in M' represents the *neutral form* of the method of extension and intension. Distinctions made in M are preserved in M' , but formulated in different way: there is no duplication of entities, there is distinction between relations of equivalence and L-equivalence among expressions, designation and L-designation among expressions and entities. The apparent duplication of entities is the duplication of modes of speech, *non-neutral mode of speech/formulation* in M and *neutral mode of speech/formulation* in M' . In Carnap's opinion, the non-neutral mode in M and neutral mode in M' cover the same domain, and the choice between them is a matter of practical preference and purpose. So, the question was how semantical sentences in M can be translated in M' . Both languages are nonextensional, and for each of them semantical sentences are formulated. But, the question that interest Carnap is whether *extensional metalanguage for semantics is possible*, or is it possible to construct extensional metalanguage which would be sufficient for the formulation of complete semantical description, even of nonextensional object language. As he said, the semantical description of object language is complete if it is sufficient for understanding of every sentence of language (and if it is L-equivalent to any sentence of metalanguage).

⁹³ Ibid., p. 164-6.

⁹⁴ Ibid.

⁹⁵ Translation of semantical sentences which refer not to nonlinguistic entities, but only to expressions in the object language, involve no difficulty at all. These sentences are sentences about *truth*, *L-truth*, *equivalence* and *L-equivalence*. What Carnap wanted to show is that the whole of semantics, with respect to the object language systems, can be translated from M into M' .

M' is not extensional since it contains three nonextensional terms:⁹⁶ modal term *necessary*, term *L-equivalent* in its nonsemantical use, and term *L-designate*. To extract only the extensional sentences of M' and no others, Carnap introduces metalanguage M_e which contains nothing but those sentences. It is possible to construct this metalanguage out of M' by eliminating all sentences containing the nonextensional terms. The main question now is whether complete semantics (of extensional system S_1 and intensional system S_2), can be formulated in extensional metalanguage M_e . Carnap takes it possible and in that purpose he gives a scheme of complete system of semantical rules for S_1/S_2 , briefly interpreting each of them:⁹⁷

- a. the *rules of formation* constitute a definition, or determine the admitted forms of 'sentences'; these rules do not contain the expression itself but only refer to expression by using a name for it, or a variable for which a name can be substituted;
- b. the *rules of designation* refers to primitive individual and predicator constants, the relation of designation is extensional and hence does occur in extensional metalanguage;
- c. the *rules of truth* state that simplest atomic sentence, consisting of predicate followed by an individual constant, is true iff the individual to which the individual constant refers possesses the property to which the predicate refers; these rules presupposes the rules of designation;
- d. the *rules of ranges* refer to assignments (assignment is function which assigns individual constant as value to variable and state-description as arguments); if reference to one assignment in true statement is replaced by reference to another equivalent assignment, then the resulting statement is also true.

It easily can be seen that these semantical rules can be formulated in extensional metalanguage such as M_e . There is no need for complete informations about S_1 and S_2 , since semantical rules for these systems (formulated in M_e) enable us to know the meanings (not only extensions but intensions as well) of the designators. A critical point here is common opinion that metalanguage must contain translation of all expressions (at least all designators). It could be the case that the extensional metalanguage (like M_e) would not suffice as semantic language for intensional system (like S_2). The reason is because extensional metalanguage cannot contain expression L-equivalent to intensional sign 'N' (necessary). On the contrary, Carnap doesn't agree with this solution pointing that it is not necessary that M_e contains L-equivalent expression for every logical sign in S . Although M_e cannot contain a translation

⁹⁶ R. Carnap, *Meaning and Necessity*, p. 168.

⁹⁷ Ibid, p. 5 and 169.

of 'N', it can contain semantical rule for 'N' (the rule of ranges). His solution states that since extensional system/ S_1 , and hence extensional metalanguage M_e , always contains a sentence L-equivalent to sentence containing 'N' (sentence in intensional system/ S_2), and if M_e is sufficient for the formulation of semantics of S_1 , it is also sufficient for the formulation of semantics of S_2 . Carnap uses this argument to conclude that it is possible to give a complete semantical description of intensional language system (like S_2) in extensional metalanguage (like M_e).

4.3. Modal Systems, Modalities and Variables

Carnap's contribution to the study of modalities consists mainly of two studies: his article „Modalities and Quantification“ (published in the *Journal of Symbolic Logic* XI in 1946), and his work „On the Logic of Modalities“ (the fifth chapter of *Meaning and Necessity, A Study in Semantics and Modal Logic*, published in 1947). The previous analyses justify that the formulation of modal logic is very important. From a historical point of view, he was the first who has developed *formal modal logic* based on semantic idea (which goes back to Leibniz⁹⁸) that statement is necessary iff it is true in *all possible worlds*⁹⁹. Carnap represents possible worlds by *state descriptions* or possible interpretations of formal language. He gave the first semantic analysis of modal logic using Tarskian model theory¹⁰⁰ to explain the conditions under which any necessary proposition („necessary p“) is true. Carnap believed that modalities do not require a new conceptual framework, and that semantic analysis of language can explain modal concepts. The method used for explaining modalities is a typical example of Carnap's analysis used in method of extension and intension and method of the name relation. Various systems of modal logic are constructed in different ways and they differ

⁹⁸ Leibniz used term 'possible worlds' in his account of creation. In his view God's mind necessarily and eternally contains the ideas of infinitely many worlds that God could have created, and God has chosen the best of these and made it actual, creating it. The possible worlds are possible at least in the sense that they are logically consistent. They are possible totalities of creatures, and each world includes a whole possible universe. Leibniz distinguished *factual truths* (which hold in actual world) and *rational truths* (which hold in all worlds which God might have created). It is quite obvious that the latter is close to idea of *necessary truth as truth in all possible worlds*. This Leibnizian philosophical-theological view is different from that of modal logic (or possible world semantic for modal logic). The basic idea is that notions like validity, soundness and completeness can be defined for modal logic in terms of models constructed from sets of alternative 'worlds'. Since the late 1950s many important results have been obtained by this method, whose the best-known exponent is S. Kripke.

⁹⁹ These are the alternative worlds in terms of which we may think of possibility, and one of the most controversial topics is that about the nature of possible worlds themselves.

¹⁰⁰ A model theory is a branch of mathematical logic that deals with the connection between language and its interpretations or structures. Basic is the characterization of the conditions under which a sentence is true in the structure. A model for sentence is a structure for language of sentence in which it is true. Model theory was originally developed for constructed formal languages with purpose to study a foundational questions of mathematics. Later it was applied to semantical analysis of empirical theories and semantical analysis of natural languages (as in Montague grammar). The term 'model theory' came into use in 1930s with work on first-order model theory by Tarski.

in basic assumptions concerning modalities. The various modal systems give different answers to question whether all sentences of the form ' $Np \supset NNp$ ' are true. The different answers are due to fact that the concept of logical necessity is not sufficiently clear, and this was the main task for Carnap. To find clear and exact concepts in order to replace the vague concepts of modalities he was looking for *explicata* for modalities. In his opinion the most adequate way of explication is to establish modalities by means of *semantical L-concepts*. *Logical necessity* is taken as *explicandum*, understood as it applies to proposition (p) iff the truth of proposition is based on purely logical reasons (not dependent upon the contingent facts). Carnap recognized here the similarity between *two explicanda: logical necessity of proposition and logical truth of sentence*. Semantical concept of L-truth is to be taken as exact explicatum for logical truth of sentence, defined by *state-description* and *range*.¹⁰¹ Carnap maintains that it is natural to take the property of propositions which corresponds to L-truth of sentences as *explicatum* for logical necessity. The result is that ' $N(A)$ '¹⁰² is not just true but L-true also, since its truth is established by semantical rules which determine the truth, and thereby L-truth of ' A ' (*semantical rule for 'N'*).¹⁰³ Furthermore, if ' $N(A)$ ' is true, then ' $NN(A)$ ' is true, which means that Carnap's answer on question whether all sentences of the form ' $Np \supset NNp$ ' are true is *affirmative* (hence, $\sim Np \supset N\sim Np$ ' is true also). So, if ' $N(A)$ ' is true it is L-true, and if it is false it is L-false, and every *sentence of the form 'N(A)' is L-determinate*¹⁰⁴. On the ground of *logical necessity* the other logical modalities can be defined in the following way:¹⁰⁵ p is **impossible** means that ' $\text{non-}p$ is necessary', p is **contingent** means that ' p is neither necessary nor impossible', p is **possible** means that ' p is not impossible', and p is **non-contingent** means that ' $\text{either } p \text{ or non-}p \text{ is necessary}$ '. Also, *possibility* can be taken as primitive to define necessity and its negation:¹⁰⁶ p is **necessary** means that ' $\text{non-}p$ is impossible', and p is **non-necessary** means that ' $\text{non-}p$ is possible'. Starting with logical necessity, Carnap shows that there is correspondence between modal and logical properties. He emphasizes that proposition has one of the modal properties iff any sentence expressing the proposition has the corresponding logical properties. So, the six basic modalities can be expressed in terms of necessity and possibility and corresponding semantical properties. Proposition is either *necessary* or *impossible* or *contingent*, and this classification is analogous to the classification of

¹⁰¹ R. Carnap, *Meaning and Necessity*, p.173.

¹⁰² *Ibid.*, p. 174.

¹⁰³ *Ibid.*

¹⁰⁴ *Ibid.*, p. 175.

¹⁰⁵ *Ibid.*

¹⁰⁶ *Ibid.*, p. 176.

L-true, *L-false* and *factual* sentence (in S). But, there is one very important difference between these two classifications. The number of *L-true* sentences may be infinite while there is only one necessary proposition, since all *L-true* sentences are *L-equivalent* with one another, which means that they have the *same intension*. Similarly, there is only one impossible proposition, because all *L-false* sentences are *L-equivalent*. The number of contingent propositions is infinite, like that of *factual* sentences. Taking in this way, if M contains modal term 'necessary', then 'N(A)' can be translated into M by the sentence of the form 'it is necessary that ...' (where '...' is a translation of sentence 'A'). On the other hand, if M does not contain any modal terms, then there is no strict translation for 'N(A)'. This is the crucial point here, and Carnap's solution is that the stated correspondence makes possible the interpretation for 'N(A)' in M by means of *L-truth*.

The two modal relations between propositions are introduced, namely *necessary implication* (known as Lewis' strict implication), and *necessary equivalence* (it designates relation between intensions, not between designators). When standing between any two designators a necessary equivalence is a sign of *identity of extensions*, but in S_2 it is sign of *identity of intensions*. *Variables* should be understood as referring to intensions rather than to extensions. Here Carnap emphasizes that in system which contains variables it is needful to solve the problem of interpreting the occurrences of logical necessity. According to him, any universal sentence, in extensional or modal language, means that all values of the variable possess the property expressed by matrix. The main conclusion is that universal quantifier and modal operator (necessity) may exchange their places. Taking the definition of modalities and the analysis of variables occurring in modal sentences, we may notice that Carnap identifies necessity with *logical necessity*, which is a special feature of his modal logic. The truth value of modal sentences is logically determined¹⁰⁷, and all completely modal sentences are logically determined (every truthfunctional combination of logically determined sentences is itself logically determined).

Since modal system contains not only extensional but also intensional contexts, we have to consider the *intensions* of the designators, and not just their extensions. It is needful to determine the *value-intensions* for given variable. If system contains variables of the type of sentences, then quantifiers with such variable (occurring in modal sentences) must be interpreted as referring to *propositions*, not to truth-values. Analogously, the individual variables in modal sentences must be interpreted as referring not to individuals, but to *individual*

¹⁰⁷ Ibid.

concepts (individual concept is assignment of exactly one individual constant to every state-description, and *assignment* may be regarded as function from state-descriptions to individual constants).

Regarding the exchange of quantifier and modal operator the traditional distinction between *de dicto* and *de re* modality can be used, drawn in modal logic since the medieval period. In accordance to this, Carnap makes difference between the truth value of sentence beginning with quantifier which is *L-true*, and the truth value of sentence beginning with modal operator which is *true*. By addition of modal operators to predicate logic we obtain a system of *intensional predicate logic*, and great attention has been paid to *interactions between modal operators and quantifiers*. The order of modal operators and their interaction with the quantifiers occurring in formula is very important, having influence on meaning of the given formula and its truth-value. In other words, *de re* modal expression does not always imply the corresponding *de dicto* modal expression (like in the case of *Barcan formula*), while *de dicto* modal expression implies corresponding *de re* modal expression.

4.4. Formulation and Translation of Modal Sentences

In order to explain formulation and translation of modal sentences it is necessary to deal with distinction between extensional and intensional/modal language. The first step is *formulation of modal sentences* in object language, and second step is *translation of modal sentences* in metalanguage (M and M'). The reason for translation is an inadequate or misleading formulation of modal sentences in object language. In his analysis of the **formulation of modal sentences** Carnap shows that we can formulate these sentences either in terms of intensions or in neutral terms. Formulation in terms of extension involves risk of regarding them as meaningless or false sentences. He considers analogously three cases, the case of predicates, sentences, and individual expressions. His starting sentences are nonmodal sentence of S_2 , which are true but not L-true, and they may be formulated in terms of extension and intension in the following way:¹⁰⁸

- formulation in terms of *extension* is obtained by using the semantical/formation rule for necessity/'N', and
- formulation in terms of *intension* is obtained by using modal equivalence.

The next step is **translation** of these sentences (of S_2) into the metalanguage M , and Carnap starts with **nonmodal** sentences (of S_2) pointing out that they can be translated in two

¹⁰⁸ R. Carnap, *Meaning and Necessity*, p.187.

different ways. One way is translation in terms of intensions with nonsemantical term '*equivalent*', where Carnap used sentences like 'The *property* FB is *equivalent* to the *property* H' (the same holds for *proposition* and *individual concept*). Second way is translation in terms of extensions with the identity phrase '*is the same as*' where he used sentences like 'The *class* FB is *the same as* the *class* H' (the same holds for *truth-value* and *individual*). If translation is applied to **modal** sentence (those formulated in terms of intension and extension by using the modal operator 'N') the result will be different. They can be translated in two different ways. The first is translation in terms of intensions where modal equivalence is used as a sign for the *identity of intensions* (this holds for property, proposition and individual concept), and the second is translation in terms of extensions where modal equivalence is used as a sign for the *identity of extensions* (this holds for class, truth-value and individual). Carnap points out one very important thing here, namely that the formulation of modal sentences in terms of extension may be misleading and lead to false results. For example, the application of the principle of interchangeability would lead to false sentence like 'It is not necessary that the class H is the same as the class H' (the same holds for truth-values and individuals). In fact, these are the instances of the *antinomy of the name-relation* in its second form. If we apply the principle of interchangeability (in either form) to nonextensional contexts we arrive at the contradiction or the antinomy of the name-relation (constructed in two forms: first using the name-relation and second using the concept of identity).

So, the **translation** of modal sentences includes the analysis how the given sentences in S_2 may be translated in neutral metalanguage M' , and Carnap explains that this translation may be obtained in two ways. The first way employs the nonsemantical term '*equivalent*', corresponding neutral terms and the phrase '*it is necessary that*' (instead of sign 'N'). As a result we have sentence like '*It is not necessary that Featherless Biped is equivalent to Human.*'. The second alternative employs '*L-equivalent*', and here we obtain the sentence like '*Featherless Biped is not L-equivalent to Human.*'.

Carnap suggests that the formulation of modal and other nonextensional sentences in word-language should be framed not in terms of extensions, but either in terms of intensions or neutral terms. Formulation in neutral terms is simpler, but the nonsemantical use of the terms '*equivalent*' and '*L-equivalent*' is not customary, while formulations in terms of intensions are more customary, except in the case of the reference to individual concepts. We know that since designator has extension and intension, a variable has both value-extensions and value-intensions. It follows that the sentence with a variable can be translated either into M (in terms of its value-extensions or its value-intensions) or in M' (in neutral terms). But, the

same problem still remains, and Carnap's advice is to avoid the formulation in terms of value-extension, and use either terms of value-intension or neutral terms. He explains that we should not translate the variables (in modal sentences) in terms of extensions, at least not in the cases of classes and truth-values. The modern interpretation of modal sentences goes toward the interpretation in terms of intensions, in terms of propositions rather than truth-values, in terms of properties rather than classes. The situation with the interpretation in terms of individual concepts is different, this type of interpretation is uncustomary, and Carnap's suggestion is that in this case it is best to employ an alternative translation in neutral terms. Modal sentences with variables have a special logical nature, and it is not always possible to formulate and translate them in the word-language in a customary way. So, Carnap accepts that it is possible to combine modalities and variables, both in symbolic object language and in metalanguages M and M' , but by using the neutral variables that have classes as value-extensions and properties as value-intensions. Otherwise, namely the use of different variables for extensions and intensions would lead to the case of an unnecessary duplication of variables. Thus, the *combination of modalities and variables* leads to valid (and customary) *inferences of the logic of quantification*. This means that any system of modal logic without quantification is interesting as a ground for a wider system that includes quantification. The main decisive point Carnap overcomes by explaining that there is no objection against regarding the *designators (in modal language) as names of intensions*, and regarding the *variables as having intensions as values*. But, this does not mean that the extensions have disappeared from language. He explains that it is not possible for the predicator to possess only an extension and not an intension (to refer only to class and not to property). Analogously, it is impossible for the variable to be only class variable and not a property variable as well (but it is possible to have properties as its only values).

In spite the fact that sentences of extensional language can be interpreted as speaking about classes and individuals, Carnap emphasizes that they can be translated into the corresponding modal language, which requires not only *L-equivalence* but *intensional isomorphism* as well. Every designator and sentence in extensional language has exactly the same meaning in modal language, the same intension and the same extension. In order to see correctly the functions of both (extensional and modal language), it is necessary to abandon the prejudice that predicator must stand either for class or property, but not for both (and the same prejudice with respect to individual expression). In Carnap's opinion, to understand how language works we have to accept that every designator has both intension and extension. The development of an adequate method for the meaning analysis presupposes *logical* or

semantical and *empirical* base. A logical (semantical) base presupposes the analysis of the expression as understanding it without any factual knowledge (this is what is usually called the meaning of expression). This logical/semantical base Carnap explicates by his concept of *intension*. On the other hand, the empirical base presupposes analysis of expression with respect to the factual situation referred by given expression (its aim is establishing the factual truth). This empirical base is explicated by his concept of *extension*. Why he needed both levels? The answer could be paraphrased as the thesis that *knowing the meaning it is possible to determine the locations to which the expression applies in the actual world*.

So, we have seen that the main purpose of Carnap's semantical method was to clarify the modalities, and that his method suggests the specific interpretation of logical modalities which supplies adequate base for his modal logic. Important question is how the extension-intension distinction fits in the context of his modal logic? Our answer is that by this distinction Carnap tried to overcome the difficulties involved in combining modalities with quantified variables. It follows that semantics serves to explain modalities, that semantical context is prior to modal context providing a necessary tool for dealing with modal logic, basic modal concepts and relations are defined by basic semantical concepts and relations. And, isn't it to which the title of Carnap's book itself refers to? Does the phrase *meaning and necessity* could be understood as implying the mandatory order of concepts, relations and methods? What defines what? Important issue is to determine the relationship between the two key concepts: meaning and necessity/modality. Since Carnap has started with the notion of *meaning*, representing his method of extension and intension, and analyzing the method of the name relation as well, it is possible to take *meaning* as a primitive for defining *necessity*. Carnap's method generates the special features of meaning through extension and intension and these represent a *particular framework* for defining modality and relevant relationship with fundamental semantic concepts. Having in mind his modal logic, formulation of neutral metalanguage, translation process, and his attempt to establish an extensional metalanguage for semantics, we could recognize the nature of his notion of necessity.

III

Saul A. Kripke: Naming and Necessity

1. Possible Worlds

Before we start with Kripke's *semantics* and his *causal theory of proper names* we have to explain the concept of *possible worlds*, the central point of his semantics and modal logic. The main idea is that beside our actual world there is other, possible world/s different from our actual one. The question is how much of this other possible world is believable, or how much it is *really possible*. We may say that much of it is credible, since whatever the historical facts happen to be, we can always suppose *counterfactually* that they might have been otherwise. We constantly make such suppositions in the world of real life. The world of fiction needs no special indulgence, which understands that we can and do entertain all sorts of non realized possibilities about past, present and future. In other words, we think about things that *might have happened*, *might be happening*, and *might be about to happen*. The term '*might*' leads to the concept of '*possibility*' which is constantly present in our everyday life. The example of this possibility are the questions like 'what if things had been thus and thus?', or 'what if things are so and so?', and 'what if things were to be such and such?'. The *counterfactual supposition* is not just idle speculation, and in the matters of practice we need to consider alternatives where knowledge is denied, while in the matters of theory, we need to consider hypotheses where fact are unknown. So, actuality is surrounded by an infinite realm of possibilities, or we can say that *our actual world is surrounded by infinity of other possible worlds*. Our world, or everything that actually was, is or will be only one of infinite number of possible worlds, it is the actual world, while the others are non-actual.

The main question is *what are the limits of the possible*? Are there limits to that what we can conceive or suppose to be possible? No matter whether we think something falls within or beyond the limits of possibility, it is certain that some things are not possible, no matter how sophisticated our concepts become. For example, the supposition that time-travel *will* occur or *will not* occur sometime in the future. The time-travel case goes beyond the bounds of conceivability. It is not just paradoxical, but it is *self-contradictory*, since supposed world in which something is the case and is not the case, is not possible world, it is impossible one.

The next point which has to be clear is that *possibility cannot be taken to be the same as conceivability*. The boundary between possible and impossible coincides with that between

conceivable and *inconceivable*. Beside the overlap between conceivable and possible, the two notions are not the same. *First*, our inability to conceive certain state of affairs does not imply the impossibility of that state, and *second*, our ability to conceive certain state of affairs does not imply the possibility of that state. So, conceivability is not *necessary condition* for something's being possible, since conceivability is not needed for something to be possible. Also, conceivability is not *sufficient condition* for something's being possible, conceivability does not suffice to establish possibility. On question what are the conditions for something's been possible the answer might be that it is the *conceivability without inconsistency (coherent conceivability)* and not just conceivability itself, which is the measure of possibility. But, this answer is not adequate, especially from the standpoint of those who wish to explain the principal concepts of logic in terms of possible world. Among these principal concepts consistency and inconsistency are included. How we can invoke the consistency in order to explain what possible world is, and how it differs from the impossible one? First, it is necessary to avoid any kind of *psychologism*, or any form of theory which makes logic a function of human psychology. In its older form, psychologism holds that the laws of logic are the laws of thought, and it treated logic as a branch of psychology concerned with the description of how human beings actually reason. The main task is to avoid introducing the psychologism in its new/modern form. Problem is that if we intend to explain the principal concepts of logic in terms of possible worlds, and try to explain the possible worlds in terms of purely psychological concept of *conceivability*, we may fall in the trap of introducing the psychologism. Second, we have to avoid any kind of *circularity*, if try to define possible worlds in terms of *consistency* and consistency in terms of possible worlds.

But, there is a way out, which means that it is possible to avoid circularity and still not be trapped by psychologism. For example, the *circularity in definitions* of complexity may be avoided by looking in the dictionary and finding what it is for something to be complex. We can find that concept of complexity is opposed to that of simplicity, and if we try to define what it is for something to be simple, we can find that the concept of simplicity is opposed to that of complexity. This is circularity we have in mind here. But, this circularity can be broken by *citing examples*: by *ostension*, *naming*, *description*, and by *citing clear-cut examples* (paradigm examples) of possible worlds. In other words, one would want to include (among the possible worlds) worlds in which there are more objects than in the actual world, worlds in which there are fewer objects than in the actual one, worlds in which the same objects exist as in the actual one but have different properties, etc. The same can be applied in the case of impossible worlds, descriptions can be given of worlds about whose possibility or

impossibility we have no clear intuitions, and distinction between possible and impossible worlds is grounded in an appeal to paradigm cases.

So far we spoke of *threefold distinction* between actual world, worlds which are non-actual but possible, and worlds which are neither of these. When we speak about actual world we do not mean just the universe as it is now, in the present, but here '*exists*' is used in *timeless sense*, encompassing present, past and future. This means that actual world embraces all that it was, is, or will be. This is very important, since now it is clear that the actual world is possible world, and if something actually exists then it is obviously possible that it exists. On the other hand, not everything that possibly exists does so actually, which means that not all possible worlds are the actual. Actual world is one among many possible worlds, and there are other possible worlds beside the actual one. It must be remembered that whatever actually exists belongs to the actual world, and is located anywhere in *physical space*. On the other hand, non-actual possible worlds are not located in physical space, but they are in *conceptual* or *logical space*. Conclusion is that the class of non-actual worlds contains all possible worlds other than the actual world and all impossible worlds as well (since every impossible world is a non-actual world).

The next crucial point is that *logical possibility has to be distinguished from the other kinds of possibilities*. By 'possible world' we do not mean only *physically possible* world. Physically possible worlds form a proper subset of all possible worlds, a proper subset of all *logically possible* worlds. The logically possible situation is either physically possible or physically impossible. Physically impossible situation does not mean that it is also logically impossible situation. So, the notion of physically possible world needs to be defined in terms of broader notion of logically possible world. Similarly, a state of affairs is physically possible if its description is *consistent with* the natural laws of actual world. But, the problem is that the relation of consistency may itself be defined in terms of (logically) possible worlds. The *class of logically possible worlds* is the *most inclusive* class of possible worlds. It includes other kind of possible world as well: physically possible, physically impossible (many but not all), technologically possible (i.e. physically possible worlds that have the same physical resource and industrial capacity as the actual world), and technologically impossible (many but not all). Different subsets of set of all logically possible worlds may be distinguished, and many of them are not just of logical but of philosophical interest as well.

The question of *the constituents of possible worlds*, or how possible world are constituted, is very important. In this context we'll start with the actual world (which is the best known). Following Wittgenstein, the actual world is the totality of actually existing states of

affairs, and *state of affairs* is an arrangement of objects, individuals, or things having various properties, and standing in various relations to one another. In modern terminology, instead of objects, things and individuals, we can use the more neutral term '*items*', and instead of properties and relations the term '*attributes*'. An *item* is whatever exists in at least one possible world: physical objects, persons/individuals, places, events, abstract objects (like numbers and sets). An *attribute* (property and relation) is whatever is exemplified by any item/s in a world: properties like being red, being old, being distant, and relations like being faster than, being more distant than, being earlier than, etc. *Items* are things we would have to mention in giving the description of a possible world, they are things we can refer to. On the other hand, *attributes* are the sorts of things that characterize items, things which we ascribe to the objects of reference. Thus, items exist in possible worlds other than the actual one, and attributes are instanced in possible worlds other than the actual one. The question is how non-actual possible worlds differ from the actual one, and answer could be that they differ in three basic ways:

1. other possible worlds may contain the very same items as the actual world, but differ from the actual world in respect of the attributes,
2. they may contain at least some items which do not exist in the actual world, and differ in respect of some attributes;
3. they may lack certain items which exist in the actual world, and differ in respect of some attributes.

Some logicians have thought that other possible worlds can differ from the actual one only in the first way, while others insist that they can differ in other two ways as well. If we now consider any arbitrarily selected item and attribute, *a* as a name for item, and **F** as a name for attribute, we can define the basic semantic concepts of truth and falsity as:¹

- a) 'it is true that *a* have **F** iff *a* have **F**“,
- b) „it is false that *a* have **F** iff it is not the case that *a* have **F**“.

These two definitions are in accordance to Aristotle's view expressed in Γ - book of his *Metaphysics*, in the following way: „to say of what is that it is not, or of what it is not that it is – is *false*, while to say of what is that it is, and of what it is not that it is not – is *true*.”² Several points about these two definitions are worth to notice.

First: Aristotle's account suggests that it is persons' sayings which are true or false, which are the bearers of truth-values. In other words, the sayings, along with beliefs, sup-

¹ Raymond Bradley and Norman Swartz, *Possible Worlds, An Introduction to Logic and Its Philosophy*, Oxford, 1979, p. 9.

² *Metaphysics*, Γ - book, 7 (1011b 26-27), *The Basic Works of Aristotle*, ed. R. McKeon, New York, Random House, 1941.

positions, etc., are things which can be true or false. So, it is primarily *proposition* that has the properties of truth or falsity, or which is the *bearer of truth-values*. It follows that the things persons say, believe, suppose, etc., are true or false just when the propositions they utter, believe, suppose, etc., are true or false. So, what we have is the next:³

a*) "the proposition P (that *a* have **F**) is true iff *a* have **F**",

b*) "the proposition P (that *a* have **F**) is false iff it is not the case that *a* have **F**".

Second: Taking the above mentioned definitions concerning the falsity (b and b*), we have conditions in which the proposition *P* is false, which includes two cases: first is the possible state of affairs in which item exists but fails to have the attribute, and second in which item does not exist. Since attribute can be instanced by item in possible world only if it exists in that possible world, the failure of an item to exist in a given possible world precludes it from having any attributes whatever in that world.

Third: This account of what it is for proposition to be true/false, applies only to propositions which *ascribe properties to items*. Also, it is extended to propositions which *ascribe relations* to two or more items, and here we deal with 'two-place' attributes (relations holding between two items). So, in the case where *P* is proposition, *a* and *b* are items, and **R** is the two-place attribute/relation (which *P* asserts to hold between *a* and *b*), then *P* is true iff *a* and *b* stand to each other in the relation **R**, and *P* is false iff this is not the case. So, we can deal with *relational propositions* by pointing out that whenever an item stands in relation to one or more other items, *item* can be said to have the *relational property* of standing in given relation to given item/s.

Fourth: The represented account of truth has been described as '*the correspondence theory*', '*the realist theory*' or '*the simple theory*', according to which proposition *P* is true iff the possible state of affairs is exactly like *P* asserts. The theory defines the truth as property which propositions have when they **correspond** to possible states of affairs whose existence they assert. It is **realist** theory of truth since it makes truth a real/objective property of propositions (something which is not subjective), and **simple** because it accords with the simple intuitions, which most of people have about the conditions for saying that something is true or false.

Fifth: Having all these in mind, it is quite possible to confuse the question *what are the conditions of truth and falsity* with question *what are the conditions for our knowledge of*

³ Raymond Bradley and Norman Swartz, *Possible Worlds, An Introduction to Logic and Its Philosophy*, Oxford, 1979, p. 10.

truth and falsity. Which question is correct? This confusion is not so surprising, and the rivals of correspondence theory of truth are *coherence* and *pragmatist theory of truth*. The proponents of these theories are inclined either to deny or ignore the distinction between *proposition's being true* and *proposition's being known to be true*. The main *coherence theorist's claim* is that the one way to know what propositions are true is to determine which of them **cohere** with the rest of beliefs we hold to be true. The main *pragmatist theorist's claim* is that the one way to know what propositions are true is to determine which of them **is proved** to be useful/practical to believe. But, neither claim warrants identifying truth with coherence, or truth with practical usefulness. Both theories seem to be parasitic upon the *simple theory of truth*: the coherence theorist states that certain sets of beliefs are coherent, and pragmatist states that certain hypotheses are useful. Each implies the claim of the simple truth of propositions, and this show that the concept of *simple truth* is hard to avoid.

From these five points it should be evident that proposition asserts that item has an attribute even if it exists only in non-actual possible world, and that proposition will be true in non-actual world providing that in that world item has certain attribute. We may use „W“ to refer to any possible world, we may assert *the truth of proposition in specified possible world*, (W1) even it is not true in other specified possible world (W2). Similarly, we may assert *the falsity of proposition in specified possible world/W2*, even it is true in other specified possible world/W1, and we may assert *the truth or falsity of proposition in unspecified possible world/W*, or that proposition is possibly true or false. The result of this analysis shows that the expressions „*is true*“ and „*is false*“ do not mean the same as expressions „*is actually true*“ and „*is actually false*“. This means that proposition is actually true (or false) in the case when among the possible worlds in which it is true/false there is the actual world. But, although „*true*“ does not mean „*actually true*“, it can be used to refer to actual truth, and important thing is who use it. When person claims that proposition is true in the *actual world*, he claims that it is true in his own world. Since his world is the actual world, it turns out that he attributes the actual truth to proposition. But, when person attributes the truth to proposition in *non-actual world*, he attributes truth to that proposition in his own world, and since his world is non-actual world, it turns out that he attributes non-actual but possible truth to proposition. So, no matters which truth account (correspondence, coherent or pragmatist theory of truth) is applied, *truth and falsity do not admit the degrees*, proposition is either wholly true or wholly false, and there is no such things as partial truth or falsity. Among the items existing in various possible worlds **propositions must be included**, and their attributes are *truth* and *falsity*. In every possible world, proposition has one or other of these attributes/properties. The other

properties which proposition can have are: *possible truth*, *possible falsity*, *contingency*, *non-contingency*, *necessary truth* and *necessary falsity*. These properties are known as **modal properties**, and they depend upon the way in which truth-values of proposition are distributed across the set of all possible worlds (they are true or false in just one, some, all, or none of possible worlds). According to these properties we can speak about the corresponding kind of propositions. The *possibly true proposition*⁴ is true in at least one possible world, stating that particular item has a particular attribute (it is true in possible, but non-actual world), and we say that this proposition is possibly true. One of the possible worlds in which proposition is true could be the actual world (proposition is possibly true, beside the fact that it is also actual true). This is not a problem since the class of actual truths form a subclass of possible truths. So, proposition is **possibly true** if it is true in at least one possible world – actual or non-actual, and **actually true** if among the possible worlds in which it is true the actual world occurs. The *possibly false proposition*⁵ is false in at least one possible world. Some propositions which are possibly true are also possibly false, because there are other possible worlds in which they are possibly false/actually false. *Contingent proposition*⁶ is both possibly true and possibly false, it is possible truth/false but could have been false/truth. The contradictory proposition of true contingent proposition is *contingent and false*, while the contradictory proposition of false contingent proposition is *contingent and true*. Although the contingent proposition could be false in some possible worlds (including the actual one) there will be other possible worlds in which it is true, and vice versa. The interesting question is *are there any propositions which are **not** both possibly true and possible false?* Is there any proposition which is just one and not the other, which could not be possibly true/false but must be false/true? Such propositions would not be contingent but *non-contingent propositions*⁷. Any contradictory of non-contingent proposition is non-contingent proposition. Non-contingent proposition which must be true is *necessarily true proposition*⁸, disjunction, for example, is necessarily true. Of course, not all necessarily true propositions are of this sort, and some of them are propositions that state determinable properties, category and relational propositions, the truths of mathematics, modal propositions or true propositions which ascribe *modal properties*, true propositions which ascribe *modal relations*, and propositions whose truth can be ascertained by *conceptual analysis*. A non-contingent proposition which must be false is

⁴ Ibid., p.15-25.

⁵ Ibid.

⁶ Ibid.

⁷ Ibid.

⁸ Ibid.

*necessarily false proposition*⁹ and it would not only be false in at least some possible worlds, but in all possible worlds and actual world as well. This kind of proposition would be both possibly false and actually false, but it would not be contingent and false (false contingent proposition is true in some possible worlds). Conjunction itself is, for example, a necessary false proposition.

Further important notion is that of *modal relations*, focusing on the ways in which the truth-values of pairs of propositions are distributed across the set of all possible worlds. The main modal relations are *inconsistency*, *consistency*, *implication* and *equivalence*. Two propositions are *inconsistent* when it is necessary that if one is true the other is false, or when both cannot be true. In terms of possible worlds, two propositions are inconsistent when in any possible world in which one is true the other is false, or when there is no possible world in which both are true. Inconsistency is generic modal relation, and it could be regarded as *contradiction* and *contrariety*. *Contradiction* holds between two propositions which cannot both be true or false, in any possible world one of the propositions in contradictory pair is true and other is false, and there is no possible worlds in which both propositions are true/false. *Contradiction* holds between contingent and non-contingent propositions. *Contrariety* holds between two propositions when, although they cannot both be true, they can both be false; *contrariety* holds between contingent and non-contingent propositions. A '*self-inconsistent*' proposition can be understood as synonym for 'necessarily false' proposition (necessarily false proposition is inconsistent with every proposition whatever, including itself too). On the other hand, two propositions are *consistent* iff they are not inconsistent. In terms of possible worlds, two propositions are consistent iff it is not the case that there is no possible world in which both are true. The actual true provides a guarantee of consistency, but the converse does not hold. If two propositions are consistent it does not follow that they are both true in the actual world (there is some possible world in which both are true). Since the main concern is *to avoid the inconsistency* and *preserve the consistency*, the common concern becomes the discovery of new truths, on the ground of the already established ones. Logicians want to avoid inconsistency and to preserve the consistency (as necessary, not sufficient, condition of the truth of both propositions). *Implication* is the *truth-preserving relation*, meaning that implication of true proposition lead only to further true propositions, never to false ones. The only propositions that can be inferred (with deductive validity) from true propositions are also true. So, it is obvious that *implication is not falsity-preserving relation*. Once we have the

⁹ Ibid.

concept of implication it is easy to define modal relation of *equivalence*. Since we have *direct* and *indirect implication*, equivalence could be defined as relation of *mutual implication* that holds between two propositions. In terms of possible worlds *two propositions are equivalent iff they have the same truth-value in the same sets of possible worlds*, there are no possible worlds in which they have different truth-values. The concept of '*equivalent-class*' is synonym for the '*class of equivalent propositions*', and it can be regarded as *logical union of all equivalence-classes*.

But, it is needful to make a difference between *equivalence* and *identity*. This means that equivalent propositions are not identical, they can have identical truth-values in identical sets of possible worlds, but without themselves being identical. They can be identical in *some* respects without being identical in *all* respects: they can be equivalent without being one and the same proposition. But, some important questions are still open: how distinction between propositional equivalence and propositional identity can be drawn?, is it possible to give an account of propositional identity which will enable us to say that proposition may be equivalent but non-identical?, what means to say that two propositions are identical?, if they are identical, how can they be two?, etc. One of the greatest logicians L. Wittgenstein has tried to resolve this dilemma. According to him, to say of *two things* that they are identical is nonsense and to say of *one thing* that it is identical with itself is to say nothing at all.¹⁰ One of the possible solution is to say not that two things are identical, but that two *linguistic items* symbolize (refer to, mean, or express) one and the same thing, a view offered by G. Frege. According to him, when we say „a = b“ this is the case where sings/names ('a' and 'b') *designate the same thing*.¹¹ The phrase „two names 'a' and 'b' designate the same thing iff...“ understands appropriate *conditions of identity*¹². To make an identity-claim is not the same as to assert that two expressions have the same reference. In fact, one of the best ways to appreciate the problem that led Frege to make distinction on *sense* and *meaning* is to consider the *identity statements* to which Kripke pays his attention as well. Another solution is known as *Leibniz's principle*, or the *Principle of Identity of Indiscernibles*¹³ (known as *Principle of Non-Identity of Discernibles* too). According to this principle, it is impossible for two items to have all their attributes (including relational) in common. This account helps in distinguishing

¹⁰ L. Wittgenstein, *Tractatus Logico-Philosophicus*, trans, D. F. Pears and B. F. MsGuinness, London, Routledge and Kegan Paul, 1961, proposition 5.5303.

¹¹ G. O. Frege, „On Sense and Reference“, in *Translations from the Philosophical Writings of Gotlob Frege*, ed. P. Geach and M. Black, Oxford, Basil Blackwell, 1952, p. 56.

¹² *Ibid.*

¹³ In: *Concise Routledge Encyclopedia of Philosophy*, London 2000, p. 381; also see Audi, *The Cambridge Dictionary of Philosophy*, p. 416, 491-94.

propositional equivalence from propositional identity. It is necessary to determine the conditions of propositional identity, which will provide that propositions may be equivalent and yet non-identical. So, *equivalent propositions* cannot differ with respect to their truth-values (in the same set of possible worlds), but they can differ in respect to other attributes. On the contrary, *identical propositions* cannot differ in respect of any attribute at all, they have all their attributes in common.

The analysis of possible worlds, including propositions, their basic properties and relations, has to serve as ground for analysis of Kripke's semantics, his causal theory of proper names, and his modal logic.

2. The Bearers of Truth-Values

Propositions are said to be the items which are *the bearers of truth-values*, and they must be distinguished from the sentences which may be used to express them (for example, in the same way as number must be distinguished from the numerals which may be used to express them). The main questions are **why** they must be so distinguished, and **what are** they, if they are not to be identified with sentences? A few important things can be emphasized as to the nature of propositions. First, sentences have *physical existence* (e.g. as marks on paper or blackboards, or as patterns of sound), while propositions don't. Propositions are abstract items, expressible by physical items we call sentences, but they are not identical with them. Second, sentences do not stand in *one-to-one correspondence* to propositions, and for any given unique proposition (e.g. „two plus two equals four“) many sentences may be used to express it (sentences of different languages). Third, propositions have *logically significant attributes* (truth-values, modal properties, they stand in *modal relations*), while sentences don't. Logical operations (conjunction, disjunction, negation, etc.) can be carried out on propositions, but not on sentences. However, we can speak of conjoining propositions and sentences, but the term 'conjoining' could be ambiguous, and it is necessary to make difference between *logical* and *grammatical* operation.

So, are the propositions the only bearers of truth-values?¹⁴ No, since we may attribute truth and falsity to beliefs, statements, assertions, remarks, hypotheses and theories, and it may plausibly be argued that each of them is a genuine bearer of truth-values. But, it is not quite clear what is the truth-bearer here. Is it the state, act or disposition of believing, stating,

¹⁴ Raymond Bradley and Norman Swartz, *Possible Worlds, An Introduction to Logic and Its Philosophy*, Oxford, 1979, p. 25-45.

asserting, remarking, hypothesizing or theorizing, or that which is believed, stated, asserted, remarked, hypothesized and theorized? Could we say that *acts of believing, stating, asserting, etc., are the bearers of truth-values*? As we know, the acts of belief (statement, ...) are *temporal entities*¹⁵, they begin at some point in time and end at some point in time. During our lifetimes we will entertain thousands, millions or even billions of beliefs, statements, assertions,... Important question is whether or not the total number of belief (statement, assertion,...) acts, for all mankind, is sufficiently large for them to be identified as the bearers of truth and falsity. But, what about that which is believed, stated, asserted, etc., . as taken to be true or false? Talk about 'that which is believed' is unclear, and the question is what sorts of things can be believed. In fact, the talk about things which are believed, stated, asserted, etc., (and which can be bearers of truth-values), is talk about sentences and propositions. We again come across distinction between sentences and propositions. Let's deal with sentences first. If we ask whether sentences can be taken as the bearer of truth-values, it has to be noted that only a certain kind of sentences are plausible candidates for that. There is an ambiguity in the notion of 'sentence', and it is necessary to distinguish *sentence-tokens* and *sentence-types* (distinction known since Aristotle). In the case of sentence-types we speak of *universals*, and in the case of sentence-tokens we speak of *instances*, and sentence-tokens stand in certain way to sentence-types, they are instances of universals. Although the number of actual sentence-tokens is large, it is far smaller than the number of truths, and it is reasonable to suppose that the class of truths extends well beyond the sentential expression of these truths (there are many truths of mathematics and logic which neither have been nor ever will be expressed in sentential form). Important issue here is context-dependent and context-free sentences in general and of both types. Context-dependent sentences are not problematic, since their truth-value is determined by the context, and they have constant truth-value. On the other hand, the criteria for the individuation of context-free sentence-types are obscure, and since persons sometimes use words with different meanings, they will express different things even though the context-free sentence-types associated with their utterances are identical.

Further important question is what sorts of things propositions are. There is opinion that context-free sentences have something in common with propositions. Like propositions they are not to be identified with context-dependent sentences, but may be said to be what these sentences express or convey. Like proposition, if true they are always true and if false they are always false, they are omnitemporally true or omnitemporally false. This fact shows

¹⁵ Ibid.

that sentence-theory resembles more and more to proposition-theory. Term 'proposition' does facilitate the talk about whatever is true or false, but by philosophers inclined to proposition-theory this talk is recognized as *referential talk* (there are nonphysical things which are true or false and 'proposition' can be used to refer to them). But if propositions are neither physical nor fictional entities, what sort of entities are they? Can propositions be identified with the meanings of sentences? We have to be aware that the criteria for individuating propositions and meanings of sentences are different, the sentence-meaning of two sentences can be identical even expressed propositions are different, meanings are not expressed by sentences but propositions. It follows that it is proposition, not sentence, which is true or false, and the truth-bearer cannot be identified with anything which is unique to one or another language. This means that the bearers of truth must be things which transcend any particular language, things which can be shared by any language. Meaning, when associated with sentences, is the meaning *of* those sentences – it is not expressed by them, while propositions, when associated with sentences, are *expressed by* them. Meanings are not the sorts of things which can play the role propositions can, they just are not the sorts of things which can be true or false.

Very interesting is the thesis about identifying *propositions with the sets of possible worlds*. The set of possible worlds is not the right sort of things that can be taken as objects of belief, statement, assertion, etc. When it is said that propositions have to be identified with sets of possible worlds, what is meant is that each proposition *is a set of possible worlds*: for every proposition there is a set of possible worlds in which that proposition is true. There is opinion that this identification could be profitable, but it requires different type of description of given situation: for example, instead of saying that proposition P *is true* in some set of possible worlds, we have to say that proposition P *is* the set of possible worlds W. In this case we can talk only about sets of possible worlds, and not about both propositions and sets of possible worlds. Positive side is that we are able to avoid postulating the existence of an additional kind of abstract entity: here we deal only with one abstract entity, with (set of) possible worlds, which means that this manner of talking reduces the given ontology. In formal semantics, some areas in formal logic, epistemology and ethics, no distinction need to be made between propositions and sets of possible worlds, propositions are identified with sets of possible worlds. The sets of possible worlds could serve in purpose of explaining the logical attributes of propositions.

So, the main question whether we can identified propositions with sets of possible worlds offers two general answers. First, such identification *is possible* since there are certain properties which sets of possible worlds possess and which make them adequate for

identifying them with propositions. Second, there is opinion that it is *not possible* since sets of possible worlds possess some properties and lack some others, which make them unsuitable and non adequate for identifying them with propositions. But, it is important to keep in mind that propositions are not only the bearers of truth-values, but they are also the objects of belief, statement, assertion, doubt, speculation, remembering, forgetting, etc.: it is not only proper to say „P is true“, but also „Petra believed P“, or „Petra asserted P“, or „Petra doubt P“, and alike. We would be inclined to say that we can believe a proposition, but we would not be inclined to say that we believe a certain set of possible worlds. Also, if propositions are nothing more but the sets of possible worlds, there could be no distinction between propositional-equivalence and propositional-identity, and we would be forced to conclude that any two propositions which are equivalent (or true in just the same set of possible worlds) are also identical. Sets are completely determined by their members, and it is not possible to distinguish two sets having identical members: if set *S1* has the same members as set *S2*, then *S1 is the very same set as S2*. If we want to identify propositions with members of possible worlds, all necessarily true propositions would turn out to be identically the same set (the universal set of possible worlds), and hence there would be only one necessarily true/false proposition.

Does this mean that ***propositions are abstract entities in their own right, that they are sui generis, and not to be identified with any other kind of abstract entity?*** Why should not propositions be *sui generis*? Why should they not be abstract entities in their own right? Many logicians, mathematicians and philosophers have considered these questions, trying to specify their *ontological status*. Propositions, taken as abstract entities in their own right, play the traditionally assigned roles: they may be considered in abstraction from any sentences which are used to express them and, hence, any language whatsoever. This means that propositions are suitable for being the objects of belief, state, assertion, doubt, etc., and they are suitable for being the bearers of truth-values. On the one hand, in ordinary or causal contexts, we attribute truth and falsity to items like beliefs, but on the other hand, this attribution is full of ambiguity: we may allow that belief is true or false if the proposition believed is true or false. So, it is quite obvious that there are **categorical differences between sentences and propositions**, certain properties are applicable only to sentences and others only to propositions. *Meaningful* and *meaningless* are categories applicable only to sentences, not to propositions: sentence may be meaningless, no proposition is. But, this is not to say that every proposition is meaningful, they are neither meaningful nor meaningless. Sentences, but not propositions, are *grammatical* or *ungrammatical*, because sentences are *in* language, and propositions are not, sentences may

be translated or paraphrased and propositions not, sentence-tokens are physical states of affairs and propositions are not, sentences may be ambiguous or vague, and propositions not. On the other hand, propositions and not sentences are the *bearers of truth-values*: whenever truth or falsity is attributed to sentences, it is done mistakenly. It is propositions, not sentences, which possess (modal) *properties* and stand in various (modal) *relations* to each other. Also, there are different *techniques for referring to sentences and propositions*. We can refer to **sentences** by enclosing the entire sentence in quotation marks (*conventional name*), or by addition of the redundant terms „the sentence“ before the quoted sentence, or by using the (shorter) assigned name(s) instead of conventional name(s), like „A“ = „John loves Mary“. We can refer to **propositions**, for example, by saying that one proposition logically follows from other, we can refer to propositions by assigning them numerical names by stipulation, etc.

A crucial question is can propositions change their truth-values, or if proposition is true/false at one time in a possible world, does it have the same truth-value in the same possible world at all times, or it may change it from time to time? Can we speak about the *omnitemporality of truth* within the context of propositions?¹⁶ The basic idea is that all propositions are omnitemporally true or false, they do not become true or false: those which are true/false are always true/false, always were and will be true/false. How we can justify this answer? For the most of propositions we cannot arise question *when it became true* (e.g. when it become true that four plus four is eight). It may have been certain times when these kind of propositions, a non-contingent propositions, *became known for the first time*, the issue that play important role to Kripke's notion of *necessary a posteriori true proposition*. But, on the other hand, the proposition 'four plus four is eight' was true even before anyone knew it (it always has been true and ever will be true: it is *omnitemporally true*, and there never was a time it was anything other than true, it never *became true*). The same holds for contingent propositions as well. For example, contingent proposition, the natural law that pure water freezes at standard atmospheric pressure at 32°F is always true, and the question *when this proposition became true* has no importance. The next question is *whether this is the case for all propositions*. It is obvious that the proposition-theory would be more consistent and more simply if all propositions were to turn out to be omnitemporally true or false. It must be allowed that at least some propositions are not omnitemporally true or false, since to maintain the above claim lead to fatalism (the doctrine that all our actions are beyond our control, they are predestined). The issue is that truth-values of propositions are not causal agents: they

¹⁶ Here, we are interesting only with the question of the *temporal changeability of truth-values*.

don't cause anything, they are just not the sorts of things which make us do anything at all. If this is so, then there is no concern in allowing a proposition about the future to be conceived as true even now, without entailing fatalism. But, there is argument in favor of the thesis that some propositions become true or false at a certain time, grounded on well-known fact that words may vary in meaning over the time. One sentence may express proposition true at one time but false at some other time. But, this is not the case of proposition changing its truth-value, it is the case of sentence-type whose tokens over time express different proposition. What changes is not the truth-value of proposition, but proposition which particular sentence-type happens to express. Some logicians have tried to explore the effects of denying the omnitemporality of truth and falsity. Some have developed *tense logic*¹⁷, allowing that propositions about the future may change their truth-values over time. Others have developed *multi (many)-valued logic*¹⁸, saying that propositions about the future are neither true nor false. Both sorts of logics are close to modal logic and its basic notions and relations. But, it looks that both sorts of logics are trying to do logic in terms of sentences rather than in terms of propositions (like modal logic does).

3. Necessity, Analyticity, and A priori

The key notions *necessity*, *analyticity*, and *a priori*, Kripke considers in his *Naming and Necessity* in the context of semantics and theory of names. Modal logic is included into his semantics, PSW or *semantics of possible world*, since he deals with special type of formal semantics that includes operators for **necessity** and **possibility**. Development of his semantics marks the modern study of modal systems, and in accordance to his semantics the relation of *accessibility*¹⁹ is taken to be a *relation among 'possible worlds'*, explained in terms of modal operators. Different systems of modal logic depend on the properties of this relation (e.g. properties like reflexive/not reflexive, and/or transitive, and/or symmetrical)²⁰. In that sense Kripke's semantics provides an explicit analysis of modalities, taken modal logic as one of the basic element. What he has tried to demonstrate is that possible world semantics provides characteristic interpretations for a number of modal systems.

¹⁷ L. T. F. Gamut, *Logic, Language, and Meaning*, vol. II: Intensional Logic and Logical Grammar, The University of Chicago Press, 1991, p. 32-44.

¹⁸ L. T. F. Gamut, *Logic, Language, and Meaning*, vol. I: Introduction to Logic, The University of Chicago Press, 1991, p. 173-189.

¹⁹ L. T. F. Gamut, *Logic, Language, and Meaning*, vol. II: Intensional Logic and Logical Grammar, p.16-19

²⁰ Ibid.

In order to explain the three key notions it is interesting to pay attention to the crucial classification on the following pairs: *necessity and contingency*, or analysis concerning the notion of truth,²¹ *analytic and synthetic*, or analysis concerning the notion of statement,²² and *a priori and a posteriori*, or analysis concerning the notion of knowledge.²³

The analysis concerning the truth leads to *the first pair*, to the distinction on *necessary* and *contingent truth*. Something is *contingently true* if it is true but could have been false (or if it is the case but could be otherwise)²⁴. But, there are some features of the world that could not have been otherwise, (e.g., material objects could have different physical attributes to those they do, but they could not fail to have any physical attributes whatsoever, they could not fail to be of one size or other), and this is a *necessary* fact about physical objects.²⁵ This distinction is *metaphysical distinction* because it is to do with the way things must be in order to be the things that they are (as opposed to the way they happen to be but might have been otherwise).

But, Kripke emphasizes one important distinction: *necessity* is sometimes used in epistemological way, meaning the same as *a priori*, and sometimes in physical way, and then we may distinguish between *physical* and *logical necessity*.²⁶ He argues that necessity does not belong to epistemology but to metaphysics, and the main issue is whether something might have been true or false. He notes that answer to this question has nothing to do with anyone's knowledge of anything and it is philosophical thesis, and not a matter of an obvious definitional equivalence, that either everything *a priori* is necessary or that everything necessary is *a priori*. Both concepts may be vague, and they deal with two different domains, two different areas: epistemological and metaphysical. His example of Goldbach conjecture presents this problem in very transparent way. The thesis of Goldbach conjecture states that an even number greater than 2 must be the sum of two prime numbers. If this is true – it is necessarily true, and if it is false – it is necessarily false. The final conclusion is that Goldbach conjecture²⁷ cannot be contingently true or false, and whatever truth-value it has, it is by necessity. His further point is that in the case of absence of a mathematical proof deciding this question, none of us has any *a priori* knowledge about this question in either direction: we don't know whether Goldbach's conjecture is true or false, and we certainly don't know

²¹ See: Audi, *The Cambridge Dictionary of Philosophy*, p. 181-2, 281-83, 574-77, 601, 724-25.

²² *Ibid.*, p. 26-27.

²³ *Ibid.*, p. 26-7, 35-6.

²⁴ Saul A. Kripke, *Naming and Necessity*, Harvard University Press, Cambridge Massachusetts, 1980, p. 34-57, 58-78.

²⁵ *Ibid.*

²⁶ *Ibid.*, p. 35-36.

²⁷ *Ibid.*, p. 36-8, and 159.

anything *a priori* about it. As he reminds, no formal system decides all mathematical questions (as Gödel has proved). In his opinion, even though someone said that it is necessary (Goldbach conjecture), it doesn't follow that anyone knows anything *a priori* about it. It doesn't follow that anyone could know anything *a priori* about it, and according to him the notion 'could' here *involves some other modality*. The involvement of different sort of modality (or the change of modality), Kripke considers not just in the context of metaphysical distinction and necessity, but also in the context of epistemological distinction and with respect to *a priori*. Connection between these two notions becomes obvious, and Kripke acknowledges this resemblance, reminding on misuse of necessity (as used in epistemological way to mean the same as *a priori*).

Within the context of necessity, Kripke emphasizes very important distinction between **essentialism**²⁸ – the belief in modality *de re*, and **necessity** – the belief in modality *de dicto*. The question he arises here is can we say of any particular that it has necessary or contingent properties, or even make the distinction between *necessary and contingent properties*. His answer is that *statement* or a *state of affairs* can be either necessary or contingent. Whether a particular, necessarily or contingently, has a certain property depends on the way it is described. This claim is close to view that the way of referring to particular things is by description. Kripke illustrates this by Quine's famous example '*the number of planet*':²⁹ he starts his explanation with questions like 'Does the number 9 have the property of necessary oddness?', and 'Does that number got to be odd in all possible worlds?' Kripke accepts that *it is certainly true in all possible worlds*, and it couldn't have been otherwise, that 9 is odd. Further, the number 9 could also be equally well picked out as the number of planets: but, it is not necessary that the number of planets is odd – for example, if there had been 8 planets, the number of planets would not have been odd. (Kripke uses another example, namely that of 'Nixon'). The basic conclusion he draw is that whether an object has the same property in all

²⁸ Essentialism is *metaphysical theory* which holds that objects have essential and non-essential (accidental) properties/predications. Different issues have been central in this debate through the history of philosophy. Today, the notion of *de re* modality is generally taken to render a notion of essence. Discussions about essence and essential predications focus on the distinction between *what* an object is and *how* it is. Over the past three decades, developments in the semantics of modal logic have questioned *traditional empiristic skepticism about essence and modality*, and have given rise to a *rebirth of essentialism*. In the late 1950's and early 1960's Kripke shows how formal techniques (the fundament is Leibnizian idea of necessity as truth in all possible worlds) enable us to provide completeness proofs for a whole range of nonequivalent modal logics. Metaphysicians insisted on the intuitions underlying these formal methods: they proposed that we take the picture of alternative possible worlds seriously and that the attributions of *de dicto* modality (necessity and possibility applied to propositions) can be understood to involve quantification over possible worlds. In strict terminology: proposition is necessary true iff it is true in every possible world, proposition is possibly true iff it is true in at least one possible world. The central metaphysical claim is that the framework of possible worlds enables us to make sense of *de re* modality.

²⁹ Saul Kripke, *Naming and Necessity*, p. 40.

possible worlds depends not just on the object itself, but on how it is described. He reminds that property can be *essential* or *accidental* to an object, independently of its description.

The *notion of necessary or contingent property* is notion with intuitive content, and Kripke pays more attention to the question of essential properties, explaining that it can be understood as *question of identity across possible worlds*. His example is the following one:³⁰ we may suppose that there is Nixon in the actual world, and that there is another possible world where there is no one with all the properties Nixon has in the actual world. So, which one of these other people, if any, is Nixon? Here, Kripke emphasizes that we have to determine a certain *criterion of identity*³¹: given the previous example, if we have a criterion of identity than the question whether, in some particular possible world, Nixon has certain properties is well defined. He reminds that the problems of giving such criteria of identity are very difficult. In fact, **adequate necessary and sufficient conditions for identity** are very rare: in his opinion mathematics is the only case where these conditions are given. Important issue here is the way of looking at what possible world is, and what is the right way of thinking about the possible world. In his *Naming and Necessity*, the author gives the account of *possible worlds* stating that *possible world is given by the descriptive conditions we associate with it*. Possible world is not some distant country that we can come across, or view by telescope. It is possible counterfactual situation, like the situation in his example „he is not giving the lecture today“. Kripke explains that he just imagine the situation where he didn't decide to give the lecture, or decided to give it on some other day. In case like this, we don't imagine everything that is true or false, but only those things relevant to *giving the lecture*.

In his Nixon-example he asks whether such particular world is possible, the world in which Nixon exists but didn't win the election. His answer is positive and this possibility, or counterfactual situation, is a part of description of that particular possible world. In this way, he maintains that 'possible worlds' are *stipulated by certain definition*, and *not discovered*. *Possible world* is a complete way things might be or might have been, and actual world is possible world, too. But, it is quite possible that someone demands that every possible world has to be described in a purely *qualitative way*. In that case a counterfactual situation (and persons involved) have to be strictly defined: instead of „Suppose Nixon ...“, we must say something like „Suppose a man with a dog named Checkers, who looks like a certain David Frye ...“.³² This leads to the *failure of universal instantiation* for modal properties. He

³⁰ Ibid., p. 40-9, 51-3.

³¹ Ibid., p. 17, 42-53.

³² Ibid., p. 44.

reminds on Lewis's counterpart theory (which explain the problem of quantified modality) pointing out that his view is not a view of *transworld identification*³³: Lewis holds that similarities across possible worlds determine a *counterpart relation*, which need not be symmetric or transitive. In other words, the *counterpart* of something in another possible world is never identical with the thing itself. Kripke points two important issues common to the view of transworld identification:³⁴ first – the other possible worlds are like other dimensions of universe and they can be given only by purely qualitative descriptions, and second – either the *identity relation* or the *counterpart relation* must be established in terms of qualitative resemblance. Kripke's opinion is that this is not the way we ordinarily think of counterfactual situation, and the usual criterion of *transworld identity* demand that we give *purely qualitative necessary and sufficient conditions for identity*.³⁵ As he says, we can consider the question about necessary conditions without going into any question about sufficient conditions. This means that we have to distinguish the questions about essence and those about accident (but, to explain this we have to become familiar with his *theory of names* and his notions of *rigid, nonrigid* and *strongly rigid designators*). To Kripke, it is needful to make a sense of criteria of transworld identity: for example, if we can rigidly refer to one person (say, Nixon) and stipulate that we are speaking of what might have happened to that person (under certain circumstances), than the transworld identification is unproblematic in this case. He notes that the request of purely qualitative descriptions of counterfactual situations has many sources. One, among the rest, is *the confusion of epistemological and metaphysical, or a prioricity* and necessity. If someone identifies necessity with *a prioricity*, and thinks that objects are named by uniquely identifying properties, he may think that the properties used to identify the object must be used to identify it in all possible worlds. But, things are not 'found out' about counterfactual situation, they are stipulated. This entails that possible worlds need not be given purely qualitatively, and the properties that an object has in every counterfactual world have nothing to do with properties used to identify it in the actual world. Kripke *wonders whether the problem of transworld identification is simply a pseudo-problem*. His concern is that if statements are not reducible to those about other more basic constituents (like in his example of the statement „England fought Germany in 1943“ that cannot be reduced to any statement about individuals), and if there is some open texture in the relationship between

³³ According to Kripke, transworld identification or identity across possible worlds, presupposes that there is a special problem with the transworld identification, that we cannot stipulate to whom or what we are talking about, when we imagine another possible world.

³⁴ S. Kripke, *Naming and Necessity*, p. 15-20, 42-53, 76-7.

³⁵ *Ibid.*, p. 43, 46-7, 50-2.

them, in that case it is impossible to give any hard identity criteria. Here, Kripke was faced with *determinacy*, or with the identity of complex particular in terms of more basic ones.

This kind of transworld identification is different from the usual one. Kripke argues that although we can describe the world in terms of molecules, we can do it in terms of grosser entities as well. In fact, there is no need to use the description neither in terms of molecules nor in terms of grosser entities, despite the possibility that we may do so. Instead, we may assume that some particulars are *ultimate* or *basic*, and no type of description needs to be regarded as privileged. Kripke notices that it is not assumed that necessary and sufficient conditions are possible, and here he deals with *criteria of identity of particulars in terms of other particulars*, not qualities. If we have to describe each counterfactual situation in purely qualitative way, then we can talk only about properties of objects (all reference to objects has disappeared).

Kripke rejects the thesis that particular is just a '*bundle of qualities*'. If quality is abstract object then a bundle of qualities is the object of higher degree of abstraction, and not a particular. Kripke takes the thesis that the object is nothing but the bundle of qualities *is wrong*, and holds that object has its properties, it is not without properties. But, this does not mean that object should be identified with the set or bundle of its properties, or the subset of its essential properties. He is rigor in opinion that *essential properties are those which object could not have failed to have*, but that they should not be used to identify the object in another possible world. Such identification is not needed: there is no need that essential properties be the properties used to identify the object in the actual world (if it is identified in the actual world by means of properties). It is clear that *the question of transworld identification makes sense to Kripke in terms of question about the identity of object by means of its component parts*, but these parts are not qualities. There is no need to replace the question about the object by question about its parts. We may refer to object and ask what might have happened to it, and instead to begin with worlds and ask about the criteria of transworld identification, Kripke suggests that we have to begin with objects we have and can identify (in the actual world). After this first step, we can ask whether certain things (properties) might have been true of the objects.

The second pair is that of *analytic* and *synthetic statement*.³⁶ Statements whose truth-values depend upon the facts, or upon the way the world really is, are known as *synthetic statements*. If we know the meaning of the constituent expressions of statements, we know in advance its truth-value, and such statements are known as *analytic statements*. This is a ***logical/semantical distinction***, and it is not just about the way in which the truth-value of

³⁶ Audi, *The Cambridge Dictionary of Philosophy*, p. 26-7, 117.

statement is determined, but also about the nature of the truth-value. The determination of the truth-value consists of two factors. First factor is the meaning of the constituent expressions of the statements, which represents *linguistic component*, and second is the way the world is, which represents *factual component*. It follows that analytic statements are those whose factual component is shrunk to zero and whose truth-values are determined solely by the meanings of their constituent expressions. Kripke explains analytic statements by examples „bachelors are unmarried“ and „gold is a yellow metal“, and he accepts that analytic statement is true by virtue of its meaning, and true in all possible worlds which entails that something which is analytically true will be both *necessary* and *a priori true*. Explaining the analyticity he speaks about *certainty* too, arguing that whatever certainty is, it is clearly not the case that everything which is necessary is certain. To him, *certainty is epistemological notion*, and something can be known (or at least rationally believed *a priori*) without being quite certain.

The third pair is that of *knowing a priori* and *knowing a posteriori*.³⁷ When a fact can be established by empirical investigation, we say that it can only be *known a posteriori*, but when we try to establish the truth of some arithmetical concepts we say that such facts can be *known a priori*. Of course, this is *epistemological distinction* because it is about the way knowledge is acquired. The truth is known *a priori* if it is known independently of any experience of how things are in the world, and *a posteriori* if it can only be known as a result of experience. Kripke's example used in his *Naming and Necessity* is that of „fools gold“³⁸: if a story is found describing a substance with the physical appearance of gold, on that ground we cannot conclude that it is talking about gold, it may be talking about 'fools' gold. Kripke's conclusion is that what substance is being discussed must be determined as in the case of *proper names*, or by historical connection of story with certain substance. When connection is traced, it may well turn out that the substance dealt with was gold, 'fools' gold, or something else. The same holds for the case of *fictional proper names* like 'Sherlock Holmes' – we have the wrong impression that fictional name like 'Holmes' names possible but not actual individual. The substantive point is that in other possible worlds some actually existing individuals may be absent while new ones may appear: if in an open formula $A(x)$ the free variable is assigned to given individual as value, the problem is whether the truth-value is to be assigned to the formula in the worlds in which the individual in question does not exist.³⁹

³⁷ Ibid., p. 26-7, 35-6.

³⁸ S. Kripke, *Naming and Necessity*, p. 119, 124.

³⁹ Saul A. Kripke, „Semantical Considerations on Modal Logic“, in *Acta Philosophica Fennica*, Vol. 16, 1963, and in: Leonard Linsky, *Reference and Modality*, Oxford University Press, 1971.

Kripke takes that *a prioricity* is concept of epistemology, accepting (Kantian) traditional characterization that *a priori* truths are those which can be known independently of any experience. But, he goes further and argues that this introduces another problem: there is *another modality* in the characterization of *a priori*. What he has in mind is that *a prioricity* presupposes something which not just *is* or *must*, but can be known independently of any experience (it is *possible* to know something independently of experience). It is important to determine *what sort of possibility is in question here*, and Kripke's suggestion is that instead of using „*a priori* truth“ we have to pay more attention to question whether we know something *a priori* (or believe it true) by means of *a priori* evidence. He takes that here it is possible to change modality from **must** to **can**. If something belongs to the realm of *a priori* knowledge it couldn't possibly be known empirically, and here modality is changed from *can* to *must*. But, according to Kripke this is mistake, and he asserts that something may belong to statements that can be known *a priori* but still known by experience too. So, we believe something not just purely by *a priori* but also by *a posteriori* evidence. He explains this using the following example:⁴⁰ we may suppose that anyone who has worked with a computing machine knows that it may answer the question whether a particular number is a prime. No one has proved that the number is a prime, but machine has given the positive answer, and in this case we believe that the number is a prime on the basis of our knowledge of laws of physics, the construction of the machine, etc. In other words, we do not believe this on the basis of *a priori* evidence, but on *a posteriori* evidence. Kripke emphasizes that „**can** be known *a priori*“ does not entail „**must** be known *a priori*“. He holds that Kant is wrong: as pointed in *Critique of Pure Reason*, it follows that necessity and strict universality are criteria of *a priori* knowledge, and Kant held that if proposition is known to be necessary, the mode of knowledge not only **can** but **must** be *a priori*. On the contrary, Kripke holds that we can learn mathematical truth *a posteriori* by, for example, consulting a computing machine, or by asking mathematician. This presents the introduction to his concept of necessary a posteriori truth advocated in some lectures of *Naming and Necessity*, especially interested in the context of mathematical statements. Philosophical analysis tells us that they cannot be contingently true, which means that any empirical knowledge of their truth is *empirical knowledge that they are necessary*. This characterization Kripke applies to identity statements and to the cases of essence, and it may give a clue to general characterization of *a posteriori* knowledge of necessary truths.

⁴⁰ S. Kripke, *Naming and Necessity*, p. 35.

Both the thesis that *every necessary truth is knowable a priori* and the thesis that *every necessary truth, if known at all, must be knowable a priori*, involve the obscure notion of possibility of *a priori* knowledge. Kripke argues against both theses and holds that empirical propositions can be necessary and known to be such. He states that Kant's reference only to *a priori* knowledge of particular statements does not involve the extra modality. But, he allows that when Kant uses 'necessary' as type of proposition and '*a priori*' as mode of knowledge, he cannot be blamed for treating the two terms as interchangeable synonyms, which was a common practice in that time.

3.1. *Related Questions and Problems*

As we have seen, the above mentioned three distinctions are clearly related, and they appear to be coextensive (true) of the same things. Here, we can recognize distinction on *the relations of ideas and the matters of fact* (established by Hume), and this distinction comprises further two-fold classification:

- a. necessity, analyticity and *a priority*, (having its source in the relations of ideas),
- b. contingency, syntheticity and *a posteriority* (having its source in the matters of fact).

We may think that it is because of the relations of ideas that we are able to understand *a priority* and *necessity*. This means that if there is a class of analytic statements (those expressing the relations of ideas), their truth-value can be known independently of experience or *a priori*, since their truth-value is not determined by any facts about the world. If truth-value is not determined by any facts about world then, no matter how the world was different, their truth-value would remain unchanged, and therefore they/analytic statements express *necessary truths*.

Kripke's opinion regarding metaphysical, logical/semantical and epistemological distinction is that there are some reasons for thinking that these three distinctions may not be coextensive. In fact, *it would require some further justification to believe that all necessary truths must be expressible by analytic statements which are known to be true a priori*. After all, the three distinctions are distinctions about different kinds of facts, namely facts about the *necessary structure of the world*, facts about *meaning*, and facts about *how we obtain the knowledge*. Kant was the first who realized the importance of distinguishing between **metaphysical**, **semantical** and **epistemological** facts (he believed that there is a class of synthetic truths knowable *a priori*). It was maintained that all analytic statements depend on the *law of contradiction*, and in their nature they are *a priori*: predicate of affirmative analytic

statement is already contained in its subject (of which it cannot be denied without contradiction). It follows that, for this very reason, all analytic judgments are *a priori* even when the concepts are empirical (like at example of 'gold is a yellow metal'). But, having in mind Kripke's claim that *some necessary truths are discoverable a posteriori*, it seems that this problem is presented in quite opposite manner. We may, for instance, consider the astronomical discovery that the morning star is in fact the same heavenly body as the evening star, and they are both, in fact, the planet Venus. This is an *empirical discovery* and no amount of *a priori* could possibly have revealed this fact to us. But, it is nevertheless a necessary fact and Kripke argues that the statements of identity are guaranteed by logic to be true in every possible world (if we accept that everything is the thing it is and not some other thing, then every object is *necessarily self-identical*). But, as applied to statements, the terms 'necessary' and '*a priori*' should not be taken to be (and they are not) synonyms. What Kripke argues here is that these two notions are not even coextensive, and that 'necessary a posteriori truths'⁴¹ and 'contingent a priori truths'⁴² both exist. Kripke insists that it is not trivial to argue that just because something is known *a posteriori* that it is not necessary truth, and because something is known *a priori* that it is necessary truth.

Also, we cannot avoid consider these notions together in the context of **statement** and **truth**. Kripke maintains that there is something which is both necessary and *a priori*, and it is analytically true statement. It follows that *analyticity* (analytic truth and analytic statement) includes or comprises both *necessity* (necessary truth and necessary statement) and *aprioricity* (*a priori* truth and *a priori* statement). Discussion about *analyticity*, *necessity* and *aprioricity*, and their connections, involves the problem of **singular attributions of existence**. In his *Naming and Necessity*, the author reminds on fact that philosophers, inclined to description theory of naming, very often argue that we cannot say of object that it exists, and that a supposed statement about the existence of object is a statement about whether certain description (or property) is satisfied. As we know, a '*cluster concept*' is one in which most of properties, but not all, used to identify *the kind* must be satisfied. But, as Kripke says, possession of most of these properties need not be necessary nor sufficient condition of the membership of particular kind. He disagrees with this view, pointing out that other considerations about *de re* modality (about an object having essential properties)⁴³, can be regarded correctly if the dis-

⁴¹ Ibid., p. 35-8.

⁴² Ibid., p. 14-5, 54-7.

⁴³ Ibid., p. 39-53. Kripke states that it is possible to discover the essence, or essential properties, in empirical way. Discussion about the essential properties of particulars includes some basic principles like: *principle of necessity of identity for particulars*, *principle that the origin of an object is essential to it*, and

inction between *aprioricity* and *necessity* has been recognized. Interesting distinction is that between 'nominal essence' (advocated by P. Geach⁴⁴) and essential property (considered by Kripke). Geach holds that any act of pointing is ambiguous, and someone who baptizes an object by pointing to it must apply a sortal property to disambiguate his reference, and to ensure the correct criteria of identity (if we assign a reference to 'Nixon' by pointing to him, we have to say that we use 'Nixon' as a name of that particular man). Sortal property can be taken as a part of the meaning of the name. Names do have a (partial) sense, but their senses need not be complete enough to determine their reference (as they are in description and cluster-of-descriptions theories). A *nominal essence* should be understood in terms of *aprioricity*, not necessity, and statements like 'Nixon is a man.' or 'Jolly is a horse' would be *a priori truths*.

Putnam's view⁴⁵ that the statements about species, statements like 'Cats are animals', are *less necessary* than statements like 'Bachelors are not married' is interesting to Kripke. He admits that such statements are not known *a priori*, and hence are not analytic. In fact, whether a given kind is a species of animals is a matter of empirical investigation. Kripke's thesis is that the *epistemological sense is what Putnam means by 'necessary'*, and the question is whether such statements are necessary in non-epistemological sense. Some differences are obvious: Putnam is inclined to *cluster concept theory*, especially by suggesting that this theory applies to proper names as well, while Kripke presupposes that *analytic truth is one which depends on meanings in strict sense and therefore is necessary as well as a priori*. Kripke makes objection not just to Putnam (or cases involving natural phenomena and natural kinds) but to all cases that discredit the analytic-synthetic distinction, and his solution is to handle all these cases in terms of the apparatus of fixing a reference.

principle that the substance of which the object is made is essential. We should not confuse the type of essence involved in temporal question with the question concerning the necessity and not time. The question „What properties object must retain in order to continue to exist, and what properties can change while the object endures?“ is a temporal question, while „What properties (timeless, of course) object must have, or could not have failed to have, and what properties object could have lacked while still existing?“ is the question that concerns necessity. But, Kripke's suggestion is not that only origin and substantial properties are essential.

⁴⁴ See *Mental Acts*, Routledge and Kegan Paul, section 16, London 1957, and S. Kripke, *Naming and Necessity*, p. 116.

⁴⁵ Hilary Putnam, rejecting both Platonism and conventionalism in mathematics, has explored the concepts of *mathematical truth* and *logical necessity* on the assumption that logic is not entirely immune from empirical revision. Abandoning the functionalism, his critic relies on new theory of reference – *causal or direct theory*, the theory that he and Kripke (working independently) developed during the late 1960s and early 1970s. In his „The Meaning of 'Meaning'“ (1975) Putnam claims that the reference of natural kind terms ('water') is determined by facts about the world and the linguistic practices of speakers, and not by internal mental states of speakers. This means that he rejects the traditional conception of meaning according to which speaker's mental states determine the meaning and reference, and accepts conception of meaning on which external reality contributes essentially to meaning.

By his example of 'gold' (is it *necessary or contingent* that gold is a metal, is it *necessary or a contingent property* of gold that it has the atomic number 79) Kripke tends to show that statements representing scientific discoveries about *what some stuff is*, are not contingent but necessary truths. Since the present scientific theory is such that it is part of the nature of gold to be an element with atomic number 79, therefore it will be necessary and not contingent that gold is an element with atomic number 79. He admits that such properties which follow from the atomic structure of gold are *necessary properties* of it, but they are not part of the meaning of 'gold' and they are not known with *a priori* certainty. Putnam's example 'Cats are animals' Kripke considers as necessary truth. On this ground, he advocates that terms for **natural kinds**⁴⁶ are much closer to proper names than it is ordinarily supposed. He allows on the one hand, that 'common name' is appropriate for predicates marking out species or natural kinds ('tiger'). But, on the other hand, he also applies this term to mass terms for natural kinds ('gold'/'water'). More recent philosophy, in the case of proper names and natural kind terms, often replaces the notion of defining properties by that of a *cluster of properties*. Some *general names*, such as 'fat', 'foolish', or 'yellow', do express properties, while general names like 'cow' and 'tiger' do not (unless *being a cow* counts as a property). So, terms like 'cow' and 'tiger' are abbreviation of conjunction of properties. Can science discover empirically that certain properties are necessary? Kripke is inclined to affirmative answer and points that when we identified 'light' as 'that which enables us to see', this would not be necessary nor sufficient property for identifying the light in other counterfactual situation where people are blind (in that case we may say that light exists but did not manage to help us to see, due to some defect), the same holds for 'heat' and 'molecular motion'. The way we identify the thing ('light' or 'heat') fix the reference ('light'⁴⁷ is something which we have identified and fixed the reference of its name by giving to it a certain sensation). Kripke states that there is a certain referent which we have fixed for actual world and all possible worlds by contingent property (able to produce some sensations to us: for example, it is contingent property of 'light' that it produces such and such sensation to people). In other words, we *don't know a priori* what physical/natural phenomenon is the phenomenon which produces these sensations. We don't know this and we have discovered that this phenomenon is molecular motion – and when we have discovered this, we have discovered the identification which gives the *essential property* of the given phenomenon. The property by which we identify the phenomenon originally (that of producing such and such sensation in us) is not necessary but

⁴⁶ S. Kripke, *Naming and Necessity*, p. 122, 135-6, 139, 162.

⁴⁷ *Ibid.*, p. 98-9, 116, 126-31.

contingent property. In *the cases of species terms and proper names*, we should keep in mind the contrast between *a priori* but contingent properties carried with a term, given by the way its reference was fixed, and *analytic* (and hence necessary) properties the term may carry, given by its meaning.⁴⁸ Kripke states that the identity fixes a reference and therefore it is *a priori* but not necessary.⁴⁹ Further, the *joint sufficiency* is extremely unlikely to be necessary, but it may be true: for example, it is quite possible (metaphysically) that animal look just like tiger but is not a tiger. On the other hand, the *universal applicability* may well be necessary, if true: for example, the statement 'cats are animals' is necessary truth. Statements subsuming one species under another, we *a priori* know that, if they are true at all, they are necessarily true. Kripke's general conclusion is that ***type of the property identity used in science is to be associated with necessity, not with aprioricity or analyticity.***⁵⁰

*Theoretical identities*⁵¹ are examples of necessary *a posteriori*, and they involve two rigid designators. Kripke admits that, beside the arguments for the distinction between necessary and *a priori* truth, the notion of *a posteriori* necessary truth could be confusing. The main point is that any necessary truth, whether *a priori* or *a posteriori*, could not have turned out otherwise. Could we recognize self-evident modal principle applied to necessity: *what is entailed by a necessity must itself be necessary* (same holds for possibility)? It could be said so, as far as we talk about *logical necessity* (logical possibility)⁵². However, in the case of some necessary *a posteriori* truths, under appropriate qualitatively identical evident situations, the corresponding qualitative statement might have been false. This is not strange because it is possible (in the absence of proof or disproof) that, for example, mathematical conjecture be either true or false. But, since we are concerned with *how things might have turned out otherwise*, it is necessary to check out prior evidence and corresponding statement, and their supposed contingent relationship. If we say, 'Gold *might* turn out not to be an element', '*might*' here is ***epistemic*** expressing the fact that evidence does not justify *a priori* certainty that gold is an element. Kripke is right when he says that the elementhood of gold was discovered *a posteriori* and, according to him, when we say 'Gold *might* have turned out not to be an ele-

⁴⁸ For species, as for proper names, the way in which the reference of term is fixed should not be regarded as a synonym for the term. In the case of proper names, the reference can be fixed in various ways, while in an initial baptism it is fixed by ostension or description. Otherwise, the reference is usually determined by a chain, passing the name from link to link. The same observations hold for general term like 'gold'.

⁴⁹ For example, 'heat', or 'light', might have existed, though we did not. 'Heat', like 'gold', is a rigid designator, whose reference is fixed by its definition. Other natural phenomena, such as electricity, are originally identified as the causes of certain concrete experimental effects.

⁵⁰ S. Kripke, *Naming and Necessity*, p. 138.

⁵¹ *Ibid.*, p. 98-100.

⁵² *Ibid.*, p. 35, 41.

ment' – 'might' here is *metaphysical*. Once again, what we may recognize here is the *three-fold distinction* (metaphysical, logical-semantic, epistemic), which means that Kripke used these contexts to explain necessity, analyticity and *apriority*.

4. Kripke's Semantics and Causal Theory of Proper Names

4.1. Kripke's Semantics

Previous „possible worlds“- analysis provides the answers on questions like: what we mean by „possible worlds“, in which contexts they can be used, how truth and falsity are related to „possible worlds“, with what kind of propositions we are dealing in the context of possible worlds semantics- *PWS*, and what are the main relations between these propositions. Both, the concept of possible worlds and propositions are used to explain how various logically important properties and relations of propositions can be explicated in terms of how truth-values of propositions are distributed across the set of all possible worlds. Many contemporary philosophers and logicians believe that term „possible worlds“ provides a single theoretical framework powerful enough to explain and resolve many philosophical and logical problems connected with necessity, contingency, non-contingency, possibility, implication, equivalence, validity, distinction between logical and physical necessity, identity conditions of propositions and concepts, connection between meaning of sentence and truth-conditions of proposition, distinction between accidental and essential properties, ethics (ethical theory is determination of unique set of ideal worlds, which is possible world), counterfactuals (whatever the historical facts happen to be, it is possible to suppose *counterfactually* that they might have been otherwise), etc.

Talk about possible worlds can be found in writings of great mathematicians, philosophers, and logicians. In early 1960s, Kripke has returned to famous Leibniz' possible world using it to illuminate philosophical base of logic, pushing the frontiers of logic in new directions. He accepted possible worlds as *abstract entities* like numbers and propositions, maintaining that without such kind of entities it is not possible to make ultimate sense of logic. Why? He explains that existence of these abstract entities provides the uniformity of logic, expand development and better understanding of logic. Modality and modal logic, counterfactuals, propositions and properties, are some concepts illuminated by 'possible worlds'. After Kripke, it becomes standard to do formal semantics for languages with modal operators by providing models of worlds and objects in these worlds, taking modal statements as true according to relevant models (if worlds in those models meet certain conditions).

What is meant by *PWS*? To provide semantics for language containing modal operators means to provide certain type of semantic models for it. By specifying the models we provide a mechanism for producing counter-examples (counter-models) and method (beside axiomatic proof procedure) to be able to see what conclusions might be drawn from given set of premises. The capacity for constructing counter-examples is important for checking out what arguments are valid or invalid. Possible world models bring out and explain the various constraints on the accessibility relation. The *formal semantics* consists of constructing models using sets of various kinds, and functions from sets to propositions/sentences (or other objects representing propositions or sentences). Objects in these models are „worlds“. *PWS* presupposes interpretation of formal language with modal operators as having its truth conditions. In this sense *PWS* refers to *set of formal linguistic and logical techniques*. A number of philosophically inclined linguists and logicians believe that there are possible worlds and the relation of truth relative to possible world. They accept that proposition is (*metaphysically*) *possible* iff it is true relative to some possible world, and (*metaphysically*) *necessary* iff it is true relative to every possible world.

But, there are dozens of accounts of what *possible worlds are* and what the *true-relative-to-a-world relation* consists in. Some take both, possibility and necessity as primitive notions and use them to analyze possible worlds, rather than the other way around. But, there are many different modal discourses which is due to many different ordinary language uses of 'possible', 'necessary', 'can', 'must', 'might' etc. So, there can be no single *PWS* in all varieties of modal discourse. As a matter of fact, the varieties of modal discourse represent no problem, and our choice is to represent the most important one, namely Kripke's semantics. Many of these modalities are logically interrelated, and most of them can be reduced to central modal concept. Theories of possible worlds and *PWS* techniques have been put to large number of successful uses. The various possible world interpretations are complex projections, and they mirror a formal syntax.

It is important to show how possible worlds may be incorporated into the *semantic framework* of logic. *Epistemic logic* is usually formulated as *normal modal logic*, using semantics developed by Kripke. A simple normal modal logic is *classical propositional logic*, extended by addition of modal operators, containing a countable set of atomic propositions. Syntax is defined by special rules concerning necessity and possibility. Negation and disjunction have their standard meaning, and remaining connectives of classical propositional logic can be defined as usually. Semantics is given by introducing the *accessibility relation*, which defines what is considered to be accessible from every other world. The main two

modal operators are duals of each other in the same sense that universal and existential quantifiers are. All these preliminaries provide an introduction to Kripke's *PWS* or *formal semantics for languages with modal operators for necessity and possibility*. In basic version, the *frame* for sentential language with necessity and possibility is a pair (W, R) , where W is (non-empty) set of possible worlds, R is binary relation on W known as accessibility. A *model* on the frame (W, R) is a triple (W, R, V) , where V is *valuation function* that assigns truth-values to sentence letters at worlds. Kripke defines necessary truth as truth in all possible worlds, e.g. A is valid in model (W, R, V) if it is true at all worlds $w \in W$ in that model. It is valid in frame (W, R) if it is valid in all models on that frame (or in all frames). In predicate logic versions a frame may include component D that assigns a non-empty set D_w of objects (the existents at w) to each possible world w . Terms and quantifiers may be treated as **objectual** (denoting and ranging over individuals), **conceptual** (denoting and ranging over functions from possible worlds to individuals), and **actual/possible** (denoting and ranging over existents/possible existents).

Generalizing Carnap's semantics, Kripke uses *accessibility relation* to be relation among possible worlds. But, this may represent the difficulty in maintaining the semantics that provides an explicit analysis of modalities it interprets. Questions about which version of semantics is correct are connected with questions about the nature of things and worlds. Kripke's original idea is to demonstrate that *PWS* provides characteristic interpretations for a number of modal systems, and for these reasons his formulation has become standard. *Relational semantics* or *PWS* provides simple solutions to some older problems regarding distinctness and relative strength of various systems. *PWS* suggests parallel interpretations for notions whose patterns of inference were known to be similar to *necessity* and *possibility*, obligation and permission, epistemic necessity and possibility, provability and consistency. It imposes important constraints on the meaning of modalities.

4.2. Theory of Proper Names

4.2.1. The background of Kripke's theory of proper names

The theory of proper names is view that proper names *designate* what they name, in virtue of causal connection, and this is a special case of the *direct reference view of names*. On this approach, proper names (like 'Petra') are *purely denotative* (as Mill⁵³ held) and they denote the individuals who are called by them. Proper names do not indicate any attributes as

⁵³ In his book *A System of Logic*, J. S. Mill has developed the doctrine that names have denotation but not connotation.

belonging to those individuals. Important division is on *connotative* and *nonconnotative* terms. This distinction is reaffirmed by Kripke in his *Naming and Necessity*, where he follows Mill in holding that proper names must be understood as nonconnotative. To insist on this classification means to reject the opposite view held by Frege. Since Kripke's lectures, theories of names have come to be thought of as divided into two opposing types – *Fregean* and *Millian*. Mill's conception of the nature of proper names was taken to be incompatible with that of Frege, and support for Mill's view was seen as evidence against Frege's view. The central tenet of Frege's view is that name has both reference and sense (wherein the mode of presentation of referent is contained), while Mill held that *proper names lack connotation*. If sense had to be understood as connotation, then the views would be contradictory. If, on the other hand, senses could be divided into *connotative* and *nonconnotative*, then fact that names have senses would not entail that they have connotations. In this way the acceptance of Mill's classification need not entail the rejection of Frege's theory (it could be considered that they are both right and that names have nonconnotative senses). Kripke points that Mill's distinction needs further clarification. His division is division on *terms that do two things* and *terms that do one thing only*. *Non-connotative terms* signify subject or attribute, while *connotative terms* denote subject and imply attribute. Terms 'signifies' and 'denotes' are used interchangeably, and important question is what these terms have in common. In Mill's terminology they „signify,“ „denote,“ „stand for,“ or „are names of“ things of which they can be truly predicated. His example shows that both terms 'Socrates' (nonconnotative term) and 'virtuous' (connotative term) denote Socrates: we can truly say of this man both, Socrates is Socrates and he is virtuous. This entails that connotative and nonconnotative terms have a *range of correct application* or *extension* in common. On the other hand, they differ in the ways in which they come to have their extensions. A *connotative term* applies to individual because of term-independent attribute that individual possesses, and *nonconnotative term* applies directly to individual. Connotative term may be either general or singular, while nonconnotative term is singular term applied just to individual. The *difference between the predication of nonconnotative and connotative term* is in the kind of information conveyed. But, they are both meaningful terms, terms that convey the information, both apply only to those individuals that satisfy certain conditions, and both serve to show that designated individuals satisfy those conditions.

On the other hand, Frege develops his theory of *singular terms*, which can never be predicates. Replacement of singular term designating object by other term designating the same object for Frege results in statement of different cognitive value. Using his example, we may say that the fact that morning star is morning star is not doubted by anyone, while the fact that

evening star is morning star is not known to everyone. This means that there must be something about singular terms – other than their referents – that implies the difference in cognitive value. Frege’s solution is well known: *in addition to its referent, a singular term has a sense, and its sense is a mode of presentation of the referent.* To give a sense of term is to state the attribute that determines the referent. Frege’s idea that singular terms have senses provides the explanation for the difference in cognitive values of sentences. The exchanged terms need only to have different senses to yield sentences of different cognitive value, sense is epistemic base for identifying the referent. But, the difficulty arises with question about *the sense of ordinary proper name.* On question what is the sense of the name ‘Aristotle’, Frege’s answer was that a name’s sense may vary with its user. It follows that his theory of sense works only for definite descriptions, and not for names.⁵⁴ Kripke criticizes Frege for using the term ‘sense’ in two senses: first, he takes the sense of designator as its meaning, and second as way in which its reference is determined. Identifying the two, Frege actually supposes that both are given by definite descriptions. Kripke rejects both assumptions, and points that description may be used as *synonymous* with designator, or to *fix its reference.* It is common opinion that descriptions are ambiguous, and that sometimes they *non-rigidly* designate the object satisfying the description, while sometimes they *rigidly* designate the object actually satisfying the description. Here, we may recognize two Kripke’s ideas underlying this issue:⁵⁵ the idea of fixing the reference as opposed to the definition of one term as meaning of the other, and the idea that definitions intend to fix a reference, rather than to give the meaning of phrase, or to give a synonym.

So, Kripke asks, what has to be known to know the referent of the name ‘Aristotle’? Clearly, one must know who bears the name, and no other attribute is relevant.⁵⁶ He emphasizes that the unification of these two semantic theories yields to the theory of great explanatory power. Kripke explains that *Millian theories* have generated puzzles out of the fact that names have cognitive content: puzzle of the failure of substitutivity in epistemic contexts, and

⁵⁴ Usually the Fregean sense is interpreted as different from a ‘reference fixer’. The referent of the name is determined by causal chain of communication, rather than by description. In formal semantics of modal logic, the sense of term, say term *t*, is usually taken to be the function which assigns to each possible world *W* the referent of term *t* in *W*. For a rigid designator such function is constant, and ‘sense’ corresponds to the notion of *giving a meaning*, and not to that of *fixing a reference*. Kripke explains this by his example of ‘stick S in one meter long’: in this use of ‘sense’, the phrase ‘one meter’ has a constant function as its sense, and its reference is fixed by the phrase ‘the length of stick S’, which does not have a constant function as its sense. In other words, Kripke states that ‘one meter’ is rigid designator, while ‘the length of stick S’ is nonrigid designator.

⁵⁵ S. Kripke, *Naming and Necessity*, p. 60.

⁵⁶ Why did Frege not see that there are two sorts of sense — connotative (term-independent) and non-connotative (term-reflexive)? The explanation is probably to be found in his conception of content as independent of language. Suggesting that name may have various senses, he asserts that the same sense has different expressions in different languages, or even in the same language. Kripke points that Frege simply overlooked the fact that not all properties of objects are independent of their relations to language, and consequently, it did not occur to him that word could be essential to sense.

puzzle of meaningful names without bearers. *Fregean theories* have conflicted with the fact that names never change referents when the sentences (in which they occur) are taken as assertions about counterfactual situations. However, both of these phenomena – *cognitive content* and *rigid designation* – are immediate consequences of unified theory. *Mill's followers* are unable to explain the cognitive content of proper names, because they think of them as having only extension, while *Frege's followers* think that name's sense is attribute independent of the name itself. Kripke's point is that *connotative singular term, or definite description, will typically be nonrigid designator*. On the other hand, *nonconnotative term* is not only singular but also rigid. The *bearer relation* is two-place relation between name and bearer – not a three-place relation involving speakers. So, *name designates its bearer at every possible world in which the bearer exists* – not just those in which the name is used.

Two sorts of objections to this unified theory can be anticipated. Some take that the bearer relation is circular and is not adequate for determining the referent. Others object that this relation is not circular but strict. Kripke emphasizes that term 'Socrates' cannot mean the individual referred to by „Socrates“, in fact, 'Socrates' means 'the bearer of the name „Socrates“'. This account seems circular only if *being the bearer* is not distinguished from *being the referent*. Name gets the bearer at its origin, but only if the intended bearer exists. The established bearer relation is independent of any use of the name. Name gets a referent when it is used to refer, but only if it has a bearer and if bearer exists in the appropriate circumstance of evaluation. *Being the bearer is a name's mode of presentation of referent, while being the referent is a result of referential use of name*.

The sense of name that emerges from the unification of these two theories turns out to be neither circular nor rarely satisfied. It is precisely the sense that name requires. Word-reflexive or nonconnotative sense is all sense that name needs, in order to determine the referent, the same referent in every circumstance. In this context, name is rigid designator because it has nonconnotative sense. Proper names may suggest certain properties to many speakers, but such associated information is not part of the definition of name. It follows that names have no definitions. Names are attached to things, and once attached they become a socially available device for making the relevant name bearer.

The *direct reference approach* is sometimes misleadingly called the ***causal theory of names***. But, the key idea has nothing to do with causation: a proper name functions as a tag or label for its bearer, not as surrogate for descriptive expression. Contemporary defenders of Mill's conception, like Kripke (and K. Donnellan), are interesting in connection between *present use of name* and *referent*. Here, Kripke introduces the notion of *historical chains of*

*communication*⁵⁷, and his example is the case of baptism, the thesis that name is spread by usage from link to link (by chain). This emerges a historical chain of uses of name that, according to Kripke, bridges the gap between *present use of the name* and *the individual so named*. The historical chains of communication is known as *causal chain of communication*, and the main idea is that one's use of name can be taken as causal factor in listener's ability to use the name to refer to same individual. In his „*Naming and Necessity*’ Kripke occasionally refers to the chain of communication as causal, chain of communication means that name has been passed by tradition from link to link. But, this is not to suggest that there is no view properly called 'causal theory of names' (there is such view, but it is not view that Kripke is inclined to accept).

4.3. Kripke's Theory of Proper Names

Many philosophers have maintained that proper names are really disguised definite description, and that the meaning of proper name is equivalent to the meaning of some definite description. On the contrary, Kripke refutes this appealing to two types of arguments, those directed to *what might have been the case* and those directed to *rigidity of designation*. Our main task is to consider these arguments and to show does Kripke really refute these theses or not. The basic features of his *theory of proper names* Kripke offers in his *Naming and Necessity*, and the *relation of naming* is the first topic he pays attention to. Here, by name he understands a **proper name**, name of person, city, etc. He points that modern logicians are interested in definite descriptions, but he uses that notion in negative sense, while 'name' is used so that it *does not include* definite descriptions. Name includes only those things in ordinary language called as 'proper names'. As a common term for names and descriptions he uses the term '*designator*'.

According to Kripke, it is more adequate and less misleading to use technical term *denote* rather than *refer*. The speaker may refer to something other than to the referent of name, and this case requires neither theory that names are ambiguous, nor modification of Russell's theory of descriptions.⁵⁸ His use of 'refer' satisfies the schema that „the referent of

⁵⁷ S. Kripke, *Naming and Necessity*, p. 92-6.

⁵⁸ We already know that Russell has maintained that ordinary proper names (which he contrasted with logically proper or genuine names) have definitions, and that they are abbreviated definite descriptions. He has pointed out that names don't abbreviate descriptions and don't have any sense. But, he also says that, just because the things that we call 'names' do abbreviate descriptions, they are not really names. For example, since 'Walter Scott' does abbreviate a description, 'Walter Scott' is not a name. He concludes that the only names that really exist in ordinary language are demonstratives such as 'this' or 'that', used on particular occasion to refer to object with which speaker is *acquainted*. See: L. Linsky, 'Reference and Referents', in *Philosophy and Ordinary Language*, University of Illinois Press, Urbana, 1963.

'X' is 'X', where 'X' is replaceable by any name or description“. But, to get more detail insight into Kripke's theory of proper names, we have to become familiar with important notions like speaker and semantic reference, attributive and referential use of definite description, and other related notions.

The fact is that *people refer* and that *expressions refer*, and these phenomena are known as **speaker reference** and **semantic reference**. Answer to the question what connection exists between these two phenomena depends of the fact how we theorize about various referring expressions, demonstratives, etc. One of the major distinction here is that between two basic uses of definite descriptions (pointed by Donnellan): *attributive use of definite description* (definite description is intended to say something about whatever is true of), and *referential use of definite description* (definite description is intended to single something out, but may not correctly describe it). This distinction is important and it contributes to understanding of how definite descriptions work. It shows the *necessity of bringing in the speaker reference for the explanation of semantic reference of expressions*. Important question is whether these two uses of definite descriptions represent the two semantics functions, one in which the description conveys speaker reference, and in other don't? Can speaker reference be separated from semantic reference?

Speaker reference consists in „what the speaker has/had in mind“, and some philosophers (Donnellan and Geach) agree that *speaker* or *personal reference* is reference corresponding to verb 'refer' (predicated of persons not of expressions). Speaker reference does not determine the semantic reference of expression he used. Referential/attribution distinction understands that speaker uses the definite description with accompanying active belief (about somebody/something that fits under description), and sometimes with no such accompaniment. But, this account of speaker reference ignores the speaker's intentions towards his audience, with respect to what he has in mind. Such intentions can be crucial for the existence of speaker reference. So, the referential/attribution distinction, the presence or the absence of speaker reference, should be thought of as based on such speaker intentions toward his audience, or lack of them.

The status of definite descriptions is also important, since they can be uttered in referential and attribution context. In referential context, speaker reference exists relative to definite descriptions. This means that speaker intends to refer to something and intends his audience to recognize his reference by his use of definite description. Similarly, a definite description will be uttered in attribution context when speaker reference relative to it is absent. It seems that both (semantic and speaker reference) refer to denotation of description (if it has

one). It is possible to maintain (like Donnellan) that the truth or falsity of utterance containing the definite description depends on denotation of the description, and its semantic referent is its denotation. In any case, it will not be possible to set aside speaker references as unimportant for determining semantic reference.

Philosophers have often contrasted definite and indefinite descriptions, the first are used to speak of some particular thing, which does not hold for the second – the use of indefinite description involves no reference to particular thing. Definite article indicates that particular reference is being made, and according to Russell, sentences containing definite descriptions (primary occurrences) assert that one thing uniquely has the properties ascribed by the description. There are several features of usage of definite descriptions. One is that when we use indefinite description we become entitled to use definite description too (initial sentence containing indefinite description can serve to introduce a particular thing, and that justifies the subsequent use of definite description). In general, there are two ways in which definite descriptions can be introduced into discourse, and these are analogous to referential and attributive use/context, depending whether speaker reference is present or not. In *referential contexts* (speaker reference is present) the speaker will use definite description with no further introduction, or he can begin with introduction by indefinite description. On the contrary, definite description in indirect discourse contexts is *neither referential nor attributive*.

The problem of *synthetic or semantic ambiguity* is at issue here, and the question is whether sentences (containing definite descriptions) that can be used either in referential or attributive contexts, are ambiguous. The problem of ambiguity may require that the question of what it is to have something in mind, has to be answered first. We may recognize important problem about the nature of the referential-attributive distinction, namely that this distinction is neither syntactic nor semantic. The grammatical structure of sentence seems to be the same whether the description is used referentially or attributively, which means that we don't have synthetic ambiguity. On the other hand, it does not seem correct to suppose an ambiguity in the meaning of the words, which means that sentence does not appear to be semantically ambiguous.

4.3.1. Kripke about Speaker and Semantic Reference

Kripke has discussed some issues inspired by Donnellan's paper „*Reference and Definite Descriptions*“, those concerned with *speaker* and *semantic reference*⁵⁹. He points out that Donnellan makes objections to both Russell's theory of definite descriptions and

⁵⁹ See: L. Linsky, 'Reference and Referents', in *Philosophy and Ordinary Language*, University of Illinois Press, Urbana, 1963, Kripke's article.

Strawson's theory. The issue is not who is right, but whether Donnellan's theses refute any of these two (or both) theories. He briefly reminds that Strawson's theory is modern substitute for Frege and Russell's theory. The main idea of „substitutive theory of proper name“ is that name is not disguised description, but it still abbreviates some cluster of descriptions (its reference is determined by the cluster of descriptions). The question is whether this is true, and Kripke regards both stronger and weaker version of this view. He pays more attention to the stronger version, according to which the name is simply defined, synonymously, as the cluster of descriptions. He is more inclined to view that unitary/classical theories (like Russellian and Fregean) are preferable to theories postulating ambiguity, pointing out that Donnellan's theses seem to postulate semantic ambiguity between referential and attributive use. In attributive use speaker states something about whoever/whatever is so-and-so, while in referential use speaker uses description to enable his audience to pick out whom/what he is talking about. Kripke's point is that in attributive case, definite description might be said to occur *essentially* while in referential case definite description is a tool for calling attention to person/thing.

Kripke points that speaker-semantic reference distinction can be identified with *de dicto* – *de re* distinction, or small – large scope distinction⁶⁰, in modal or intensional contexts. Using the well-know example of „the number of planets is necessarily odd“, he emphasizes that this sentence can mean two things, depending on whether it is interpreted *de dicto* or *de re*. If it is interpreted *de dicto*, it asserts that the proposition (that the number of planets is odd) is *necessary truth*, which Kripke takes to be false, since it is quite possible that there might have been eight planets. On the other hand, if it is interpreted *de re* it asserts that the actual number of planets/nine *has the property of necessary oddness*. In accordance to Kripke's essentialist orientation, this thesis could be taken as true. It follows that *de dicto case* is to be identified with attributive use, and *de re case* with referential use. Kripke takes this assimilation to be confused and he gave some main objections. His first objection is that *de dicto use of definite description cannot be identified* either with referential or attributive use. He reminds that this was already noticed by Frege: if description is embedded in (*de dicto*) intensional context, it cannot be said that we can talk about the thing described, no matter to its satisfaction of description. For example, the sentence „It is possible that the king of France in 1976 should have been bald“ *is true* if read *de dicto*, of course. But, it is not possible to use „the king of France in 1976“ *attributively* to speak of the king of France in 1976, for there is

⁶⁰ Ibid.

none („the king of France in 1976“ *refers*, in this context, *to its ordinary sense*). So, if we want to speak of reference it cannot be of *the non-existent king*: even if there were such king, the quoted assertion would say nothing about him, if read *de dicto*. On the other hand, to say that king might have been bald would be *de re*. The second objection is that *de re use of definite description cannot be identified* with *referential use*. We will use the 'planet'-case once more: let us suppose that we have no idea how many planets there are, but astronomical theory tells that the number must be odd. If we say: „The number of planets (whatever it may be) is odd“, our *description is used attributively*. From the essentialist point of view, and on the ground that all odd numbers are necessarily odd, we will say: „The number of planets (whatever it may be) is necessarily odd.“, and Kripke says that this use is as *attributive* as in the first case. His final objection concerns the *small – large scope distinction* in modal context. He reminds that Russell wanted to handle *de dicto – de re distinction* with his notion of *scope of description*, and his intention was to find out whether referential/attributional distinction can be replaced with scope of description. The starting example is modified sentence from previous example „the number of planets might have been necessarily even.“ Kripke's point is that in its natural use, this sentence can be interpreted as true, for there might have been exactly eight planets, in which case the number of planets would have been even, and hence necessarily even. But, this sentence, interpreted as true, is neither *de re* nor *de dicto* (definite description neither has the largest nor the smallest possible scope). Kripke explains that if we take that sentence gives description of the *smallest possible scope (de dicto)* then it says, falsely, that it might have been necessarily that there was an even number of planets. If we take that sentence gives description of the *largest possible scope (de re)* then it says, falsely, that the actual number of planets (nine) might have been necessarily even. What we have here, according to Kripke, are *iterated intensional operators*, and when they are so iterated, intermediate scopes are possible. In fact, as intensional constructions are iterated, there are more and more possible scopes for definite description, which means that no twofold distinction can replace the scope of description (neither *de dicto-de re* nor *referential-attributional* distinction).

Kripke considers speaker and semantic reference also as special cases of the notions of *what the speaker words means* and *what he means*.⁶¹ If speaker has designator in his idiolect, conventions of his idiolect *determine the referent* (in the idiolect), and this is what Kripke calls the *semantic referent of designator*. The referent will be determined by the conventions

⁶¹ Ibid.

of language, speaker's intentions and various contextual features. So, the *referent of name* or *description* in Kripke's sense is semantic referent, and for name it is the thing named, and for description it is the thing uniquely satisfying the description. Here, Kripke asks important question of relation between names and descriptions, which is the key point in his theory of proper name (in the case of some terms we may ask whether they are names or descriptions, for example, does the term 'God' *describes* God as the unique divine being, or it is a *name* of God). On the other hand, *speaker reference* is more difficult notion, and the speaker referent of designator is object about which speaker wants to talk on given occasion. Kripke points that speaker uses the designator to make assertion about object, and speaker referent is the thing that speaker refers to by the designator (though it may not be the referent of the designator) in his idiolect. Speaker reference could be extended to include more cases where *existential quantification*, rather than designation, is involved. Semantic referent of designator is given by general speaker intention to refer to certain object (whenever the designator is used), while speaker referent is given by specific intention (on a given occasion) to refer to certain object.

General conclusion is that speaker referent *versus* semantic referent is contrast that Kripke invokes in his argument against the semantic significance of referential-attributive distinction. If description is used referentially, the speaker referent may be distinct from the semantic referent, while in attributive use they cannot be distinct. But, Kripke's distinction may seem misleading, and the reason is because definite descriptions, being quantificational phrases, do not have semantic referents at all (not like singular terms) and they merely denote.

4.3.2. Identity Statements

The main question concerning the *statements of identity*⁶² is „Are they necessary or contingent?“. First, Kripke argues that everyone agrees that descriptions can be used to make *contingent identity statements*, and explains this by example of 'the man who invented bifocals was the first Postmaster General of the USA'⁶³. His basic conclusion is that *when we make identity statements using descriptions, than we can deal with contingent fact*. Second, he argues that we may have the situation that two names have the same referent, and express it by an *identity statement*, and this is the question of *identity statements between names*⁶⁴. Kripke also regards another type of identity statement, which comes from scientific theory – a thesis called 'the identity thesis', with respect to some psychological concepts. For example,

⁶² S. Kripke, *Naming and Necessity*, p. 97.

⁶³ *Ibid.*, p. 98-9, 145-6.

⁶⁴ *Ibid.*, p. 99-100.

some philosophers think that pain is certain material state of brain/body, while others reject this. It follows that there is *correlation* between pain and these states of body, and that this is contingent correlation between two different things⁶⁵ – because this correlation was empirical discovery. Therefore, by 'pain' we must mean something different from this state of body/brain (therefore, they must be two different things). So, the main question Kripke begins with is how *contingent identity statements* are possible. This way of phrasing the question is to assume that there are such statements, and this is what Kripke tries to *deny*. He points that we know that there can be contingent identities, but they might have been false. His argument goes like this: we may take any case in which x is identical to y, and accept that x and y have all properties in common (if x has some property F, so does y). But, x possesses the property of self-identity (x is necessary identical with itself), and if y is identical to x (and shares all x's properties) then y is also necessary identical with x. It follows that *all identities are necessary identities*, and *no true statement can express a contingent identity*. Thus, Kripke considers the three types of such statements:⁶⁶

1. those *involving two different ordinary names*, which he calls 'proper names' (e.g. 'Hesperus is Phosphorus.');
2. those *involving different definite descriptions* (e.g. 'The first Postmaster General of the USA is identical with the inventor of bifocals.');
3. those *involving theoretical identifications* (e.g. 'Heat is molecular motion').

The first type of identity statements, those involving *two different ordinary names*⁶⁷, Kripke explains by example of 'morning star is evening star'/'Hesperus is Phosphorus.' A reason to think that 'Hesperus is Phosphorus' is contingent Kripke finds in fact that this is *a posteriori discovery*. The real content of this identity statement is that the star which we saw in the evening is the star which we saw in the morning, and this gives the real meaning of the identity statement in question. Another type of identity statements, those involving *two different proper names*⁶⁸, Kripke explains by Quine–R. B. Marcus debate⁶⁹. Marcus holds that *identities between names are necessary*, and that if someone thinks that Cicero is Tully (using 'Cicero' and 'Tully' as names) one must hold that this is necessary truth. Kripke admits that it is true that we can use name 'Cicero' and 'Tully' to refer to Cicero without knowing that Cicero is Tully. He concludes that we (necessary) don't know *a priori* that the identity

⁶⁵ Ibid., p. 98-9.

⁶⁶ Ibid., p. 98-100.

⁶⁷ Ibid., p. 98.

⁶⁸ Ibid.

⁶⁹ Ibid., p. 100.

statement between names is true, but it doesn't follow that the statement so expressed is contingent, if true. It is ordinary to think that if we can't know something *a priori* then it got to be contingent, and Kripke *takes this to be wrong*. On the other hand, his argument Quine explains by 'Hesperus-Phosphorus'-example and concludes that when we discover that we have tagged the same planet twice, our discovery is empirical, and not because the proper names are descriptions. Here Kripke argues that 'Hesperus' and 'Phosphorus', used as names, can be taken as *rigid designators*, which means that they refer in every possible world to planet Venus. He maintains that it is only a *contingent truth* (not true in every possible world) that the star seen in the evening *is* the star seen in the morning, because there are possible worlds in which Phosphorus was not visible in the morning. Further, the contingent truth shouldn't be identified with the statement that Hesperus is Phosphorus: it could only be so identified *if we thought that it was a necessary truth* that Hesperus is visible in the evening, or that Phosphorus is visible in the morning. But neither of these are necessary truths, and Kripke says that they are contingent marks by which we identify and name certain planet. So, ordinary names cannot be genuine names.

Beside these, he considers the identity statements involving *different definite descriptions*⁷⁰. He takes as contingent that one person (in this case it is Benjamin Franklin) may fit to two different descriptions: one and the same person is the first postmaster general of USA and the man who invented bifocals⁷¹. Both descriptions are true of the same man, and this is an empirically discoverable fact. Here Kripke argues that this does not affect the crucial point, namely that the person who actually was the first postmaster general is identical with the person who actually invented bifocals. This identification *holds necessarily*, and to deny it is to deny that Benjamin Franklin is himself.

The third important type of identity statements are those involving *theoretical identifications*⁷². These statements are *necessary but a posteriori*, and as characteristic theoretical identifications Kripke uses statement „Heat is the motion of molecules“ (which are not contingent but necessary truths, and here he didn't mean on physically necessary, but necessary in the highest degree). We may, falsely, take that „Heat is molecular motion.“ is contingent by identifying heat with *nonessential property* (property of producing sensations of heat), and by generating hypothetical cases in which such sensations are produced in the absence of molecular notion to conclude that (their differences shows that) their identification

⁷⁰ Ibid., p. 97-8.

⁷¹ Ibid., p. 98, 145-6, 154.

⁷² Ibid., p. 99.

cannot be necessary. Kripke reminds that the identity theorists have been concerned with distinct types of identifications like identification of person and body, particular sensation with particular brain state, and types of mental states with the corresponding types of physical states. Each of these identifications presents *analytical problem* which cannot be avoided by appeal to the *confusion of synonymy with identity*. Some philosophers have accepted the identity of particular sensations with particular brain states, but deny the possibility of identity between mental and physical types. On the contrary, Kripke insists on *type-type identities*⁷³, and argues that there is no other case of essence that is more obvious than the fact that *being a pain* is a necessary property of each pain. The identity theorist inclined to this strategy must argue that *being a sensation* is contingent property. This strategy is adopted by many identity theorists, and they believe that the identity of brain state with the corresponding mental state *is to be analyzed on the paradigm of the contingent identity* (like contingent identity of Benjamin Franklin with the inventor of bifocals). So, the typical view is that *being a pain* (as property of physical state) is to be analyzed in terms of the *causal role* of the state, in terms of characteristic stimuli which cause it and characteristic behavior it causes.⁷⁴ Kripke takes such analyses to be false arguing that *the causal role of the physical state* here is regarded as contingent property of state, and it follows that the contingent property is the mental state⁷⁵. This is *absurd* to Kripke since it follows that the very pain we now have could have existed without being a mental state at all. He has not discussed the converse problem (which is close to Cartesian consideration) that if brain state could have existed without any pain, it seems that pain could have existed without the corresponding brain state. He points out that *being a brain state* is essential property, being a brain state of specific type is essential property. His point is that anyone who maintains the identity thesis cannot accept the Cartesian intuitions, it follows that some things, which appear to be contingent, turn out to be necessary.

His interest in *type-type identity* he exemplified by the identification of pain with the stimulation of C-fibers. These identifications are supposed to be analogous with type-type identifications like the identity of heat with molecular motion. Kripke is interesting in analogy holding between materialist identification and that of heat with molecular motion. He notices that both identifications identify two types of phenomena. It is usually hold that the identification of heat with molecular motion, and pain with the stimulation of C-fibers, are *contingent*.

⁷³ Ibid., p. 144, 145-55.

⁷⁴ For example, see D. Armstrong, *A Materialist Theory of the Mind*, London and New York, 1968; see the discussion review by T. Nagel in *Philosophical Review* 79, 1970; see D. Lewis, 'An Argument for the Identity Theory' in: *The Journal of Philosophy*.

⁷⁵ S. Kripke, *Naming and Necessity*, p. 146.

'Heat' and 'molecular motion' are both *rigid designators* and identification of the phenomena they name is necessary. Does the analogy hold in the case of 'pain' and 'C-fiber stimulation'? Answering this question, Kripke states that 'pain' is *rigid designator* of the type (or phenomenon) it designates: if something is pain it is essentially so, and it would be absurd to suppose that pain could have been some phenomenon other than it is (the same holds for 'C-fiber stimulation', provided that 'C-fibers' is rigid designator). Explaining this analogy, Kripke finds it important to pay attention on use of terms like 'correlated with', 'corresponding to', and the like, because they give rise to objection. He reminds that both *dualist* and *identity theorist* agree that there is correlation/correspondence between mental and physical states. Dualist holds that the correlation relation is irreflexive, while identity theorist holds that it is a special case of identity relation. Kripke's explanation shows that terms 'correlation' and 'correspondence' can be used neutrally, without prejudging which side is correct.

Having in mind distinction on metaphysical, semantical/logical and epistemological facts and the above analysis, it could be possible to provide the answer on question what strategy is used to handle the question of contingency of *necessary a posteriori statements*. This question is very important, and Kripke's strategy was „to argue that although the statement itself is necessary, someone could be in the same epistemic situation as the original and in such situation qualitatively analogous statement could be false”⁷⁶. Further, in the case of identities between two rigid designators the strategy was to consider how the reference of the designators is determined. Kripke holds that *correspondence between brain state and mental state* has obvious element of contingency. It was shown that identity is not relation holding contingently between objects, and that the *identity thesis* is correct: contingency cannot lie in the relation between mental and physical state, it cannot lie between phenomena. In the case of mental phenomenon there is *no appearance beyond the mental phenomenon itself*, and within this context Kripke emphasizes the possibility of physical state without corresponding mental state. The reverse possibility – the possibility of mental state without the physical state ('pain and C-fiber' – example) presents problems for the identity theorists, which cannot be resolved by appeal to the analogy of heat and molecular motion. So, no identity theorist have made no plausible argument against the intuitive view of materialism, and Kripke takes that materialism holds that physical description of the world is complete description of it, and that any mental facts are *ontologically dependent* on physical facts (in the sense of following from them by necessity). He has some doubts about the identity theory and remarks that some iden-

⁷⁶ Ibid., p. 150.

tivity theorist-arguments are weak and based on ideological prejudices. His remark is that the rejection of the identity thesis does not imply the acceptance of Cartesian dualism, and his own view suggests the rejection of Cartesian thesis. In general, Kripke regards the mind-body problem as wide open and extremely confusing, and that is the reason why he didn't go in more detail analysis about this problem.

However, he extends these considerations on '*natural kinds*' discussion, maintaining the thesis that their essential properties are not phenomenal, but micro-structural. From his gold-example it follows that fool's gold is not gold, despite looking like gold, and conversely, anything with atomic number 79 would be gold whatever it looks like. As we have seen, he has argued that the necessity of identity goes against the mind-brain identity theory, and that type-identity theorists model their hypothesis on theoretical identifications such as 'heat is molecular motion.' Kripke's argument leads to possibility that rules out any identification between mental and physical.

4.3.3. *Rigid and Nonrigid Designators*

Kripke's thesis is that the identity statement, like 'Hesperus is Phosphorus', if true is necessary true, which is in accordance to thesis that all identities are necessary identities, and no true statement can express a contingent identity. To show this, he introduces the distinction between *rigid* and *nonrigid designators*,⁷⁷ distinction regarding the way in which designators designate the objects that they designate: some designate the objects *rigidly* (in all possible worlds), and some *non-rigidly* (not in all possible worlds). *Rigid designator* has the same reference in all possible worlds, but this does not mean that designated object exists in all possible worlds, name just refers rigidly to that object. *Nonrigid or accidental designator* can refer to different objects in different counterfactual cases. Kripke notices that when we think of property as essential⁷⁸ to an object, we mean that it is true of that object in any case where it would have existed. In other words, a *rigid designator of necessary existent* can be called *strongly rigid*⁷⁹. Kripke points that this distinction is not co-referential with distinction between proper names and descriptions. He states that *ordinary names are rigid designators*, while the *most descriptions are nonrigid*. This thesis he takes as a ground for his *argument against the equivalence of proper names with definite descriptions*: they cannot be equivalent if they designate in different ways.

⁷⁷ Ibid., p. 48-9.

⁷⁸ Kripke's point is that important properties of an object need not be essential, unless 'importance' is used as a synonym for essence. An object could have (had) properties different from its actual properties, or properties we use to identify it with.

⁷⁹ S. Kripke, *Naming and Necessity*, p. 48-9.

Kripke appeals to linguistic use to determine whether or not an expression is rigid designator. He employs the expression in counterfactual context to see whether we can say that it referred to what it actually refers to (or to something else). For example, if we say „Nixon might have been a Democrat”⁸⁰, according to Kripke, it is clear that we are talking about the very same Nixon, who was in fact a Republican. On the other hand, if we consider statement like „The thirty-seventh President might have been a Democrat”⁸¹, this can be interpreted in two ways:

- a. as *de re* claim about the person who was elected to that office, or claim that he *might have been* a Democrat, and then *it is about* Nixon;
- b. as *de dicto* claim: statement „The thirty-seventh President was a Democrat“ *could have turned out true*, and description can pick out any number of persons in different counterfactual situations.

Kripke takes such considerations to *refute* the claim that ordinary names are disguised definite descriptions (Russell’s thesis). If this thesis is right then name and definite description synonymous to it would have identical logical properties. But, as we have seen, while ‘Nixon’ is *rigid designator*, description ‘the thirty-seventh President’ could designate different persons (in distinct counterfactual situations). In *Naming and Necessity* the Frege-Russell view that names are introduced by description, may be taken either as the *theory of the meaning of names* or the *theory of their reference* (as opposite to Kripke, Frege and Russell are inclined to the first solution).

Claim that name is *rigid designator* is restricted to the way in which *words function in particular language*. It is possible to use certain description (‘the body located at a certain place at a certain time’) *to fix the reference of term*, but once this is done, the *name is not synonymous with the description* (nor it stands for whatever fits that description). So, names are not synonymous with definite descriptions and in his *Naming and Necessity* Kripke offers other arguments to confirm this. We can use his example of ‘stick S is one meter long’. Beside the fact that this kind of statement could be taken as necessary and *a priori* truth, Kripke is more interesting in stipulating the *definition* of meter. The issue is that person who used this definition, does not give the meaning of ‘meter’ but *fix its reference*. The definition is used to fix the reference: there is certain length which that person wants to mark out, and he marks it by accidental property, namely that there is a stick of that length. There is a difference between phrase ‘one meter’ and phrase ‘the length of stick S at time t^0 ’, and

⁸⁰ Ibid., 52-3.

⁸¹ Ibid.

according to Kripke the first phrase is meant to designate rigidly a certain length in all possible worlds. On the other hand, 'the length of stick S at time t^0 ' does not designate anything rigidly (in some counterfactual situations the stick might have been longer or shorter). He concludes that there is no conflict between the counterfactual statement and the definition 'one meter', and the reason is that definition (properly interpreted) *does not say* that 'one meter' is *synonymous* with 'the length of stick S at time t^0 '. What we have to do according to Kripke is to *determine the reference* of the phrase 'one meter' by stipulating that 'one meter' is *rigid designator* of the length (which is 'the length of stick S at time t^0 '). Having in mind the main three-fold distinction, he states that this does not make it a *necessary truth* that stick S is one meter long at time t^0 .

If we want to consider this example from the **epistemological-distinction point of view**⁸², we ask for *epistemological status* of the statement 'stick S is one meter long at time t^0 ' (in this case the metric system has to be fixed by reference to stick S and we know that *a priori*, here we deal with *a priori truth*). On the other hand, if we want to consider this example from the **metaphysical-distinction point of view**⁸³, we ask for *metaphysical status* of statement, and this kind of status will be that of *contingent statement* (here the phrase 'one meter' is rigid designator, while the phrase 'the length of stick S at time t^0 ' is not, and here we deal with *contingent a priori truth*). Kripke points out that this truth is contingent and cannot be analytic since *analytic truths are both necessary and a priori*. Anyway, the important thing is not just to accept this example as an instance of the contingent *a priori* truth/statement, but as certain illustration of distinction between the two kinds of definitions:⁸⁴ those that **fix the reference**, and those that **give a synonym**. This distinction can be recognized in the context of names as well: we may suppose that the reference of name is given by *description/cluster of descriptions*, and in this case, if name means the same as description/cluster of descriptions, then name *will not be rigid designator*. This means that name will not necessary designate the same object in all possible worlds, because *other objects* might have had the given properties in other possible worlds. However, it seems plausible to suppose that in some cases the reference of name is fixed by *description* and therefore names are not always rigid designators.

In general, it is possible to interpret *description theories* in two ways. *First*, we may say that the meaning of name is synonymous with some descriptive phrase, or set of such expressions, and *second*, we may say that such descriptions determine the reference of name,

⁸² Ibid., p. 56.

⁸³ Ibid.

⁸⁴ Ibid., p. 57.

in given situation (actual or counterfactual) name stands for whoever satisfies the description. Kripke *denies both claims*. He allows that in some cases description can fix the reference of name, but insists that the name stands for *actual person or thing*, even in counterfactual cases in which it does not satisfy the description. In other words, there are two kinds of definite descriptions: *non-rigid* and *rigid definite description*. Both kinds of definite descriptions can be introduced. There is opinion that definite descriptions are *ambiguous*, and that *nonrigid* and *rigid definite descriptions* are the source of the *de dicto-de re* distinction.⁸⁵ Kripke is not convinced with such ambiguity. His view is that proper names are *always rigid*, but he allows that it is logically possible to have single words that abbreviate nonrigid definite descriptions, but in that case these *would not be names*. To Kripke, the point is not just terminological, and such abbreviated nonrigid definite descriptions would differ (in important semantical feature) from proper names.

In his *Naming and Necessity* Kripke gives the argument against *the description (or cluster-of-descriptions) theory of proper names*. The argument is concerned with cases where the referent of name (person named by the name) did not satisfy the descriptions usually associated with it. Kripke explains this by 'Gödel-example'.⁸⁶ The name 'Gödel' might be taken to mean 'the man who proved the incompleteness of arithmetic', and if Gödel had been a fraud who had proved nothing and took the credit from an unknown named 'Schmidt', then 'Gödel' would refer to fraud, and not to the man who really satisfied the definite description. Kripke notes that although the argument refutes the description theory as a theory of reference, it shows that the descriptive properties do not determine the referent, it does not show that names are not abbreviated definite descriptions. He emphasizes that *referential descriptions* can easily refer to things that fail to satisfy the descriptions, and that nothing shows that names are not synonymous with such descriptions. Someone can use the phrase „the man who proved the incompleteness of arithmetic“ as a referential definite description to refer to Gödel. If hypothetical fraud were discovered, the description is no longer usable to refer to Gödel (it can be used only to refer to Schmidt). What has to be done is to withdraw previous assertions using the description to refer to Gödel. But, it does not follow that we can similarly withdraw the name 'Gödel', even after the fraud was discovered ('Gödel' would still be used to name Gödel, not Schmidt). In other words, we come to Kripke's basic conclusion that *name and description are not synonymous*. The referential use of description has *semantic reference to Schmidt but speaker reference to Gödel*. In the presence of true information, speaker and

⁸⁵ Ibid., p. 62.

⁸⁶ Ibid., p. 83-92, 161.

semantic reference will coincide thereafter, and the description will no longer be used to refer to Gödel. Thus, *the relation of description to what it denotes is fundamentally different from the relation of name to what it refers to*. This is suggested by fact that we speak of individuals satisfying descriptions and not names. When Kripke speaks of semantic reference of definite description he means on its denotation. If we distinguish reference from denotation as two different species of what Kripke calls *designation*, then *all referring expressions are rigid designators and all denoting expressions are nonrigid designators* (except those rigid *de facto* like 'the smallest prime'). Pointing out that there is a difference between proper names and definite descriptions, Kripke argues that proper names always designate rigidly, while descriptions sometimes designate rigidly. But, he says, it is possible to formulate the theory of proper names were in talking about the actual world, sentences employing proper names are equivalent to sentences employing definite descriptions (or clusters of such descriptions). *Sentences involving descriptions used to talk about possible worlds* are ambiguous because the designation in question may or may not be rigid. *Sentences using proper names* show that they are equivalent in meaning to corresponding sentences involving definite description (when descriptions are understood as designating rigidly). One of Kripke's arguments about proper names is about *what might or might not have been the case*, or what might or might have not been true about their referents. In this context he asks *whether name has any reference at all* (e.g. when we ask whether Aristotle ever existed)⁸⁷. He explains that what is questioned here is not whether Aristotle exists, but *whether anything answers to properties* associating with name Aristotle (e.g. property like *Greek philosopher who produced certain works, the teacher of Alexander the Great, Plato's student, Greek philosopher who was born in Stagira*, etc). So, in the case of *genuinely proper names*, like 'Aristotle', Kripke points out that their sense may *diverge*, it is not a necessary truth that Aristotle had the properties commonly attributed to him. He concludes that it is *a contingent fact* that Aristotle ever did any of things commonly attributed to him. The structure of this argument is the following:⁸⁸

- (1) suppose that it was true that proper name Aristotle is disguised description 'the teacher of Alexander the Great',
- (2) then it would be necessary truth that the bearer of the name (Aristotle) satisfied the description (to be the teacher of Alexander),
- (3) but it is a contingent fact that he did,
- (4) therefore, the initial supposition turns to be false.

⁸⁷ Ibid., p. 29.

⁸⁸ Ibid., p. 29–31.

Kripke argues that the fact that 'the teacher of Alexander' is capable of scope distinctions in *modal contexts*, and the fact that it is not a rigid designator, are both illustrated when one observes that the teacher of Alexander might not have taught Alexander (and in such circumstances, would not have been the teacher of Alexander). On the other hand, it is not true that Aristotle might not have been Aristotle and, although under certain circumstances Aristotle would not have taught Alexander, these are not circumstances under which he would not have been Aristotle. What we have here is the following argument:⁸⁹

- a. suppose that Aristotle did not teach Alexander,
- b. Aristotle still would have been Aristotle,
- c. this is incompatible with the theory that 'Aristotle' means 'the teacher of Alexander',
- d. therefore, that claim is false.

What we try to explain is that *proper names and definite descriptions are sometimes used to pick out the individuals, and talk about them in other possible worlds*. In his discussion of rigid designation, Kripke shows that this way of looking at proper names and definite descriptions as working in the same way *is wrong*. His basic conclusions are the following:

1. regarding the way about how names get their reference, *it is not the case that the reference of name is determined by some uniquely identifying properties satisfied by referent*;
2. *referent is determined by description, by some uniquely identifying property, but that property does not give a synonym or something for which the name is an abbreviation – it just fixes the reference* (by some contingent marks of the object);
3. *identity should be taken as relation between thing and itself, and identity statement between names, when true at all, is necessarily true, even though we may not know it a priori* (the basic problems come from identification, or confusion between what can be known *a priori* in advance and what is necessary).

So, regarding *the cluster concept theory of proper names* Kripke's main aim was to see how it handles the problem of existence statements, identity statements, and alike. He starts with the stronger version taking it as a ***theory of meaning***. The basic theses of the cluster concept theory of name are the following:⁹⁰

- (1) to every name or designating expression there is a corresponding cluster of properties;
- (2) one of the properties is believed by person to pick out some individual uniquely;

⁸⁹ Ibid., p. 29-31, 74-5.

⁹⁰ Ibid., p. 71.

- (3) if most of properties are satisfied by one unique object, then object is the referent of name/designating expression;
- (4) if the vote yields no unique object, name or designating expression does not refer;
- (5) the statement „If *X* exists, then *X* has most of the properties“ is known *a priori* by the speaker;
- (6) the statement „If *X* exists, then *X* has most of the properties“ expresses a necessary truth.

The special condition (C) states that for any successful theory, the account must not be circular. Kripke takes only the first thesis to be correct, while others are problematic. The first thesis is true because it is a definition, and the fact is that not everything the speaker believes about some object has anything to do with determining its reference. He holds that second thesis doesn't say that the properties pick out something uniquely, but that person believes that they do, and quite another thesis is that person's belief is correct – here we deal with the *particular reference*. Third thesis states that some properties are more important than others, and the question is how to avoid the problem of inequalities among the properties, and Kripke's point is that the cluster concept theory has to specify that.⁹¹ The thesis four is problematic,⁹² and the main underlying question is that of relevant properties. Does this mean that the name doesn't refer? Kripke's answer is negative and he points that even if conditions are not satisfied by unique object, name may still refer (the case of Jonah: given conditions may be true of no one whatsoever and yet the name 'Jonah' really has a referent)⁹³. As far as thesis (5) is concerned, Kripke holds that belief hardly constitutes *a priori* knowledge, and for thesis (6) he points that it need not be a thesis of the theory if we don't take the cluster as a part of the meaning of the name.⁹⁴ He reminds that condition (C) is not a thesis and it understands that the above mentioned theses [(1)-(6)] cannot be satisfied in a circular way.

The cluster concept theory of names taken as a *theory of reference* is example of violation of the non-circularity condition. For example, if we use the name 'Socrates', how we suppose to know to whom it refers? Kripke states that without giving any *independent criterion of the reference*, determination will be circular (which is violation of condition (C), and it cannot be used in any theory of reference). What is relevant here is not how speaker thinks he got the reference, but the actual *chain of communication*⁹⁵. But, beside the fact that name is passed from

⁹¹ Ibid., p. 83-4, see the Gödel-example.

⁹² Ibid., p. 86.

⁹³ Ibid., p. 87.

⁹⁴ Ibid., p. 87-8.

⁹⁵ Ibid., p. 93.

link to link, it cannot be said that any kind of causal chain will make a reference. This means that other conditions must be satisfied in order to make this theory (the cluster concept theory) to be the theory of reference. Kripke's final conclusion is that the whole picture given by this theory of how reference is determined is wrong, or at least problematic. His point is that we need a better picture, but we might never reach a set of necessary and sufficient conditions.

5. Kripke's Puzzle about Belief

It has been shown that traditional argument is used against *Mill's theory of names*, and his thesis that the meaning of name is exhausted by its referent. Kripke points that Mill's theory implies the transparency of proper names, which means that *coreferring proper names are substitutable salva veritate*. But, Frege and Quine's examples show that *proper names are not transparent in belief contexts*. Kripke is interesting in this problem, and in his „*A Puzzle about Belief*“⁹⁶ he argues that the problems given by the *principle of transparency of proper names* can also be generated without the use of that principle, but with some weaker and more general principles. The well known puzzle is based on assumption that the speaker is normal, sincere, and not conceptually confused. The two principles used are **disquotational**⁹⁷ (DP) and **translation principle**⁹⁸ (TP). According to DP it holds that if speaker of language/L assents to *p*, and „*p*“ is a sentence of L, then he believes that *p*. According to TP it holds that if sentence of one language expresses a truth in that language, then any translation of it into another language also expresses a truth in that other language. The explanation is given by means of the following example:⁹⁹ Pierre is a Frenchman who has heard in Paris about London's beauty and he assents to the sentence 'Londres est jolie.' But, he emigrated in England, learned English and took the residence in London, and after observing the surroundings he assents to the sentence 'London is not pretty.' Kripke points that the situation is following: the Frenchman does not realize that the town where he lives is the town depicted in the nice pictures he saw in Paris. In fact, he didn't update his earlier belief expressed by „Londres est jolie“. Then, given that „Londres“ and „London“ (just like „Hesperus“ and „Phosphorus“) have the *same reference* or *same semantic value* it follows that the Frenchman believes that London is pretty and that London is not pretty. He holds *contradictory beliefs* and therefore he is not as rational as supposed.

⁹⁶ S. Kripke, *A Puzzle About Belief*, in: A. Margalit (ed.), *Meaning and Use*, Reidel Dordrecht, 1979, p. 239-283.

⁹⁷ Ibid.

⁹⁸ Ibid.

⁹⁹ Ibid.

But, we may ask is it a real puzzle? If it is, either we have to reject the *causal theory of reference*, or we have to find solution. If puzzle works, then it is worse for the causal theory of reference. Also, solution could be to criticize and even abandon DP. Before rejecting such principle, or causal theory of reference, it should be shown whether the other theories can solve the puzzle, and Kripke notices that it is not so clear that *descriptive theory of reference* can do better. In this context Kripke was interested in basic ideas of *epistemic logics*, and the key point is the distinction between the two aspects of the *disquotational principle* (DP): first aspect – linguistic admission of belief *versus* attributions of belief, and second aspect – expressions used by believer *versus* expressions used by reporter. Regarding this distinction, Kripke agrees that it is possible to accept the first aspect and to reject the second one, or to reject the first while retaining the second. He reminds on R. B. Marcus' idea that *admission* should not be identified with belief but by 'claim to believe'. In order to maintain the expression used by speaker, we need to use more sophisticated form of DP, by inserting the additional clause: „*p* describes a possible state of affairs“. One may ask is it possible to forget that both „London is pretty“ and „Londres c'est jolie“ describe two possible state of affairs? The answer is negative because discussion is framed inside the *theory of rationality* where we have to distinguish between asserting, believing and claiming to believe. *Asserting* is relation between *language user* and *linguistic utterance*, *believing* is relation between *epistemological agent* and *a state of affairs*, and *claiming to believe* is a weaker relation than believing (and evaporates in asserting).

So, conclusion may be that Frenchman may and has to assent to the sentence „London is different from Londres“, since this sentence follows from his previous admissions. But, Kripke reminds that he does not believe it, that he just claims to believe it, because he doesn't know that it amounts to the contradiction. Once impossibility/contradiction (London is different from London) has been disclosed, the speaker would recognize that he had only claimed to believe that London was different from Londres“. Kripke regards the view according to which we may have *contradictory beliefs* (e.g. M. Dummett's view who maintains that we may have contradictory beliefs) if they are plugged into *different cognitive contexts*, such that the contradiction does not invade the entire system of our beliefs (in the cognitive context of French-viewpoint, London is pretty; while in the cognitive context of English-viewpoint, London is not pretty). According to Kripke we have to avoid the weak version of the puzzle (Frenchman believes that *p* and not *p*), and adhere to stronger version [(Frenchman believes *p*) and not (Frenchman believes *p*)]. The key of the contradiction is that we know that speaker speaks of the same town, and that therefore he is involved in the contradiction. Kripke argues that *we express the contradiction by reporting two contradictory beliefs* (which are the cognitive context of the representation of Frenchman's set of beliefs). If we have to solve the

problem we have to give Frenchman the possibility to update his beliefs, and change his mind on London, or to reach more complex belief such as: London sometimes looks pretty and sometimes it does not. Kripke says that it is possible to have some false beliefs which produce a contradiction, but if we keep our beliefs closed inside some cognitive context we may have unnoticed contradictions through different contexts.

Does Kripke's puzzle can be considered as *reduction of disquotational principle*, and created without any principle of disquotation? There is another idea (David Sosa's idea) that another hidden principle is included in Kripke-type cases, namely the **hermeneutic principle (HP)**, which represents the idea of *unambiguous name* as a *name that has a single referent*, and can be *represented by a single logical constant*. Kripke's example of that ambiguous name is name „Cicero“ used to refer to the famous orator and a pilot in World War II. But, the theory that allows that proper name have a meaning not exhausted by the reference *denies* the validity of HP. On the other hand, the only justification for HP is Mill's theory and, therefore, Kripke's puzzle can be seen as *reductio ad absurdum of hermeneutic principle*.

Beside this, Kripke's puzzle is also a puzzle about **doxastic logic**, and its ability to correctly represent our attributions of belief and intuitions about belief. *Doxastic logic* represents the *logic of belief* (doxa) which is opposite to the *logic of knowledge* (episteme, epistemic logics). Epistemic logic is taken as logic of knowledge and belief, admitting the traditional definition that knowledge is *justified true belief*. First who has discussed deeply the problem of logic for belief-contexts (after Frege) was Carnap in his *Meaning and Necessity*. He calls the belief contexts („Petra believes that p“) *hyperintensional*, and they cannot be treated within the framework of intensional logic because the failure of the substitution of equi-intensional expressions. This means that we need *relation* which is more powerful than equi-intensionality, and that relation is *relation of intensional isomorphism* or *sameness of intensional structure*. But, a major divide in the history of treatment of *belief context*, is given by Kripke and his results in his *semantic of modal logic* with the standard definition of *possible world semantics*. Since then, the different attempts have been given for logical treatment of belief contexts. One of the main problems posed in such logic is the *distinction between explicit and implicit belief*, which permits the different between the point of view of the believer (the Frenchman, for example) and the reporter. In general, what Kripke wants is to hold both *modal (and belief) contexts* and *the rationality of the speaker*. He wants to keep the (Millian) framework of direct reference, and therefore he can't accept neither Fregean nor Quinean answer, and he is not interesting in the problem of intensional structure and does not accept Carnap's solution either.

IV

Comparative Analysis: Carnap and Kripke

1. On what grounds Carnap and Kripke stand?

1.1. *Classical and Neoclassical Theories*

To explain on what grounds Carnap and Kripke stand we'll do that by reminding on classical and neoclassical theories of meaning and reference, with respect to truth-values as well, especially to necessary truth as a key notion of same study applied in modal context. It is convenient to start with *dialectic*, a process in which thesis passes into its opposite, or anti-thesis, and then into synthesis as a combination of the best elements of thesis and antithesis. First two stages of dialectic can be identified in the *study of meaning and reference*. The **thesis** may be taken to be *classical theory* according to which knowledge of the meaning of word/expression is the basis on which speakers use it to refer. This theory goes back to antiquity, but it has been developed and defended (beside Frege, Church, Lewis and Searle) by Rudolf Carnap. The **antithesis** is to be the *causal theory* according to which knowledge of causal relations (to an earlier baptismal ceremony) is the basis on which speakers refer, and this theory has been opposed to classical theory by (beside K. Donnellan and H. Putnam) S. A. Kripke. The **synthesis** is to be the *neoclassical theory* of reference, or proper theory of names defended by Jerrold J. Katz.

Our process of dialectic as applied to meaning/reference theory began in early 1960's, and it began with critics of the weak spot of the classical theory. Namely, the *classical theory* is supposed to do two things:

- a. it is supposed to explain how meaning of word/expressions which speakers use it to refer is fixed, intersubjective criteria for applying words in their language,
- b. it is supposed to account for necessary truth.

For example, sentence „Bachelor are unmarried“ expresses a necessary truth because the reference of its extralogical words is logically connected. The classical theory accounts this logical connection in terms of the *inclusion* of the criterion for applying 'unmarried' in the criterion for applying 'bachelor'. From the causal theory point of view, the weak spot of classical theory is its conception of criteria, which cannot support the doctrine of necessary truth. In other words, the attribution of meaning requires that determination of applicability or non-applicability of term (or truth or falsity of statement) should be possible by way of sense-

presentable characters. *Classical theorists* thought that meaning determines reference: if speaker knows the meaning of word, he knows how to use it to refer. Of course, this is because the meaning of word is a set of characters that are necessary and sufficient for it to apply. But, classical theory does not explain how meaning can fix the criterion for word's application in advance. Reason for this is fact that the crucial notion of fixing the meaning in advance has to be explained in a way that provides *a priori* criteria. Otherwise, the notion cannot support a doctrine of necessary truth. Without an appeal to necessary truth the classical theory offers no distinction between *semantic criteria* and *empirical criteria* for applying an expression.

On the other hand, the *causal theorists*, like **Kripke**, focus their attention on the classical theory's identification of meaning with criteria of application, and accept the view that there is no *a priori* specification of criteria. They do this by producing a number of examples to show that „what we should say about certain hypothetical cases“ depends on the contingent facts about those cases, so that the „analytic sentences“ implied in the classical theory do not exist. Although their counterexamples do not show that analytic truths do not exist, they do succeed in showing that the classical theory's account of analytic truths does not distinguish them from truths based on matters of contingent fact. For example, typical analytic sentences of classical theory are sentence like: 'Gödel discovered the incompleteness of arithmetic' (Kripke's example) and 'Cats are animals' (Putnam's example). Kripke's counterexample shows that it is mistake to claim that there is anything stronger than a *contingent connection between the criterion for applying the subject of such sentence and the criterion for applying the predicate*. In his *Naming and Necessity*, he gave example that an unknown mathematician – Schmidt – really discovered the incompleteness of arithmetic and that Gödel took the credit, explaining that Gödel is the man to whom name „Gödel“ applies, but not the person who discovered the incompleteness of arithmetic.

So, Kripke has criticized the classical theory and developed an alternative theory which may be taken as *antithesis* to classical *thesis*. It is based on the opposite assumption that all criteria of application are grounded in extra linguistic matters of facts, concepts from empirical science, and information about baptismal ceremonies. This enables the causal theory to make criteria specification depend on *a posteriori* matters of scientific or quasi-scientific facts, or events in which words become the names of their referents. In the manner of causal theorists, Kripke concludes that there is contradiction between the classical theory's rationalist approach to meaning and its empirical approach to language. The conflict between these two approaches keep the classical theory away from developing the *a priori* account of meaning that theory requires. In particular, the tendency to take *empiricist view of language*

prevented the classical theory from drawing a sharp distinction between *a priori* criteria, (embodied in the senses of words) and *a posteriori* criteria (that speakers use in reference). It is not strange, since the classical theorists conceived natural language as historical products and semantics as systems of contingent belief acquired by each generation. Such conception provides very little chance of constructing a rationalist account of meaning, account that could separate *a priori* criterion from *a posteriori* criterion.¹

A clear example of this empiricist tendency in classical theory is Searle's version of classical theory, who takes the sense of proper name as something like most of its conventionally presupposed properties, such as property of being the teacher of Alexander (this property is often chosen by classical theorists because it expresses the kind of widely known fact, often used by speakers as a basis for identifying a well-known historical figure). By adopting an elastic sense-reference distinction, it seems that classical theory does justice to both, to the prominence of such facts in referential acts, and to its central doctrine that sense determines reference.

On the contrary, Kripke's examples show that the classical theorists cannot have it both ways. As he puts it, it makes no more sense to talk about logical connection holding „in a loose sort of way“ than it does to talk about being „a little bit pregnant“. In general, either a property (or a set of properties) *is* part of the sense of proper name or *not*. If it *is*, the classical theory is up against Kripke's counterexamples, and it is clear that situations can be imagined in which a number of the conventional presuppositions fail. On the other hand, if it *is not*, the criteria for applying 'Aristotle' is not yet laid down by the language, and then the classical theory no longer has any account of how proper names refer.

Neoclassical theory is final stage of the so-called process of *dialectic* with classical theory as its thesis, and causal theory as its antithesis. To explain the neoclassical theory we may contrast it with the classical theory, and show how the differences enable it to avoid the causal theorist's objections to classical theory. This may be taken as **first** difference between neoclassical theory and causal and classical theories. The neoclassical theory takes rationalist view on natural languages, and in that way managed to avoid the contradiction in the classical theory. The example is acceptance of Chomsky's rationalist theory of grammatical structure that enables neoclassical theorists to escape the problem found with the classical theory, by

¹ For example, in expression „creature with a hart“ we may distinguish semantic and empirical, or rather *a priori* and *a posteriori*, criterion: 1. *a priori* criterion – „creature with a hart“ *has a hollow muscular organ whose contractions act as a pump to circulate blood*, and 2. *a posteriori* criterion – „creature with a hart“ *has a kidney*.

providing a framework in which it is possible to construct *intensional theory of meaning*. As it is known, this theory supplies the principle (missing in the classical theory) for distinguishing *sense and reference, semantic structure and extralinguistic belief, meaning and use*. According to this theory, grammar contains semantic, syntactic and phonological component, and semantic component can be modeled on two other components. Syntactic and phonological components are explication of 'sentence of L', and semantic component is explication of 'meaning of sentence of L'. The semantic component explicates the speaker's semantic competence, or speaker's knowledge of the compositional structure of sentence meaning. Thus, the semantic component is a theory of how speaker, who knows the syntactic and phonological structure of language, can know the meaning of its infinitely many sentences. It follows that semantic component takes the form of rules that generate *semantic representations*. The assignment of semantic representations to sentence must predict each semantic property and relation of the sentence, for example, whether it is meaningful or meaningless, ambiguous or not, whether it is synonymous with such and such other sentences, etc. The *true semantic description of language* is semantic component, whose rules predict each semantic property and relation of every sentence in the language, these rules are as simple as any other set of rules that can make these predictions, and fit together with other grammar components.

So, the intensional theory of meaning automatically yields to the *principle for distinguishing semantic from nonsemantic information*. The main ***intensional principle*** (IP) is the following one:²

IP – *the information I is semantic information for the linguistic expression „X“ iff the semantic representation of „X“ in true semantic description of language represents I as part of the meaning of „X“.*

Semantic representations that successfully predict semantic properties and relations correctly represent the meaning of the sentences to which they are assigned. The set of semantic representations draws the semantic/non-semantic distinction, just as the set of phonological representations draws the distinction between speech sounds and noise. In other words, the crucial point is that the neoclassical theory *does not appeal to extensional notions*, notions like applicability or truth, in order to say what the meaning of the word is. What enables neoclassical theory to avoid such an appeal is its *theoretical definition of meaning*. Instead of using extensional structure in order to say what the meaning of the word is, the

² *Contemporary Perspectives in the Philosophy of Language*, eds. Peter A. French, Theodore E. Uehling, Jr., Howard K. Wettstein, University of Minnesota Press, Minneapolis.

neoclassical theory uses only intensional structure, or properties and relations internal to the sense structure of the language.

This means that the conditions of reference of terms in analytic sentences are fixed in the same way as those of quantificational structures in logical truths. Conditions for sentence like „If someone is not happy, then not everyone is happy“ are fixed *a priori*, because they are fixed by judgments about the internal grammar of sentences, and not by experience. For example, conditions for sentence like „Bachelor are male“ are fixed *a priori* on the basis of judgments about the internal grammar of sentences (the grammar of the expressions 'bachelor' and 'male'), not on experience. This conception of meaning avoids Kripke's counterexample to the classical theory, and on the ground of this conception we have an *a priori* account of the relation between subject and predicate concepts, because the propositional structure of sentence is independent of applicability and contingent truth. In other words, Kripke's counterexample is irrelevant to neoclassical theory, because it does not have the proper form to be counterexample to the claim that sentence has analytic propositional structure. Such claim asserts that the sense of the predicate is part of the sense of its subject, so that anything falling under the latter concept must fall under the former, too. Let us explain this by Kripke's case: if the predication in the sentence „Gödel discovered the incompleteness of arithmetic“, shown by IP to be explicative rather than expansive, Schmidt would fall neither under the concept „Gödel“ nor the concept „discoverer of the incompleteness of arithmetic“. Thus, someone who is not the discoverer of the incompleteness of arithmetic cannot be a counterexample to an assertion about someone who is. In other words, in replacing an empiricist assumption with its rationalist counterpart we can see that Kripke's example might fail against analyticity claims. The main point is that linguistic issue about the nature of semantics is logically prior to philosophical issue between rationalism and empiricism, because the truth about the linguistic issue is part of the basis for deciding the philosophical issue. The issue between rationalism and empiricism is the question about the structure of the system used for acquiring knowledge. What the semantic description of the language looks like, has to be determined without assuming one or the other philosophical theory about the acquisition of the speaker's knowledge of the semantics.

Further interesting point is the difference between *the referent of expression* (in the language) and *the referent of the use of expression* (in the context). This is the **second** major difference between *neoclassical theory* and *classical and causal theories*, also known as *type-token difference* where the former refers to *type reference* and the latter to *token reference*. **Type reference** can be defined in the following way: X is the type referent of the expression

„W“ just in the case where X has each of the properties represented in the best hypothesis about the meaning of „W“ in the language; if nothing has each of these properties, the expression „W“ has null type reference.³ In *token reference* non-semantic information plays important role in picking out the object referred to in referential act. It is to be noted that the token reference need not (and often does not) diverge from the type referent.⁴

The distinction between type and token reference leads to **third** difference: neoclassical theory differs from the classical theory in rejecting its thesis that meaning determines reference. Distinction between type and token reference renders this thesis equivocal, and here we have two independent claims: the claim that meaning determines *type reference*, and the claim that meaning determines *token reference*. In accordance to type referent definition, neoclassical theory subscribes to first and not to second claim. The confusion in the study of meaning and reference is a consequence of the failure to recognize that the theory can subscribe to the former without subscribing to the latter.

The **fourth** difference between neoclassical and classical theory is that the neoclassical theory claims that proper nouns have no meaning, which is the direct consequence of the neoclassical theory view about meaning. As we know, the commitment of the classical theory to the doctrine that proper nouns have a meaning goes back to Frege.⁵ On the contrary to classical theory, to neoclassical theory the sense of expression is the concept the expression is associated with. The conclusion is that proper nouns have no sense: since the meaning of expression determines its semantic properties and relations, expression that has no semantic properties or relations cannot have the meaning. This is the simplest explanation of its absence of semantic properties and relations. Given that absence of meaning coincides with absence of semantic properties and relations, it is possible to reformulate the question whether proper nouns have a meaning by asking whether they have semantic properties and relations.

³ We may explain this concept with respect to the actual and possible worlds: in the actual world, for example, there are no women with supernatural powers and so the type reference of the word 'witch' is null; but in possible worlds, for example, the type reference of 'witch' is not null but women with supernatural powers.

⁴ For example, in the cases where someone refers to policeman, priest, etc., with a use of „policeman“, „priest“, etc., the token reference converges with the type reference of „policeman“, „priest“, etc., even though the speaker may pick out the policeman, priest, etc., solely on the uniform stereotype. The possibility of such divergence and convergence enables us to reconstruct the important distinction ordinary language philosophers made between standard and nonstandard uses of language (a standard referential use of an expression is a use on which its token referents are members of the set of type referents, and a nonstandard use is one on which the token referents are outside of the set).

⁵ Frege's conception of sense is not theoretical and not restricted to the intensional structure, but it reflects a primary concern with reference. For Frege, the sense of an expression is the description under which the expression is applied to object. His conception of sense commits him to say that proper nouns have sense like common nouns, but he noted that, unlike common nouns, descriptions that constitute the sense of proper nouns can differ widely from speaker to speaker. He observed that the sense of name „Aristotle“ might, for example, be taken to be the pupil of Plato and the teacher of Alexander the Great.

There is a great deal of evidence that the answer to this question is negative. Common nouns (like 'general delivery') can be questioned by asking „What is it?“ or „What does it mean?“, while proper nouns can be questioned only by asking who or what it is. The first kind of questions are alright, but the second ones, like „What does 'general electric' mean?“ are odd. It is absurd to explain the fact that proper nouns like „Mark Twain“ and „Samuel Clemens“ name the same person by saying that they are synonymous, or to explain the multiple reference of proper noun like „John Smith“ by saying that it is ambiguous.

Semantically, *nonrestrictive relative clause* is the explanatory apposition, and when such clause contains no semantic information beyond what is already in its meaning, the entire construction is semantically redundant, like „My wife, who is my spouse, saw the movie“. On the other hand, proper nouns containing explicative predicates are never semantically redundant: „Gödel, who has discovered the incompleteness of arithmetic“. In other words, the nonrestrictive relative clause guarantees the *uniqueness of reference*: we are not referring to any Gödel, but to one who discovered the incompleteness of arithmetic. This is strong evidence that the relative clause do not come from analytic sentences and that proper nouns have no meaning. The other kind of evidence comes from substitution in opaque contexts, and we can substitute one pair of synonyms for the other in belief context preserving the truth (we cannot substitute one pair of co-referring proper nouns preserving the truth).

The **fifth** difference is that the neoclassical theory denies thesis, common to both classical and causal theories, that speaker's semantic base for referring is the same. The *classical theory* adopts the use of common nouns as the model of reference and accounts for the referential use of proper nouns. On the other hand, the *causal theory* adopts the use of proper nouns as the model of reference and accounts for the referential use of common nouns. Both theories assume that the reference of common nouns and the reference of proper nouns have *homogeneous grammatical basis*: meaning in the case of classical theory, belief about the world in the case of causal theory. On the contrary, neoclassical theory claims that reference has heterogeneous grammatical basis. It accuses the *classical theory* of gaining homogeneity at the expense of making false claims about the meaning of proper nouns, and the *causal theory* of making false claims about the meaning of common nouns. The above arguments that proper nouns have no meaning are also arguments that common nouns have a meaning. In making a heterogeneity claim, the neoclassical theory asserts that speaker's use of common noun relies on knowledge of what the noun means, but his use of proper noun does not have semantic knowledge on which to rely.

The semantic component explains the *compositional meaning of sentences*, using *dictionary* and *projection rule*. The dictionary lists each of the senses of all elementary syntactic parts of sentences, and the projection rule explains how the sense of sentence is the function of the sense of its elementary syntactic parts. But, the basic problem is how to develop the uniform account of reference on heterogeneous grammatical basis.⁶ It has to be noted that the semantic component's dictionary, projection rule, and structural definitions of semantic properties and relations, together constitute the *theory of sense competence*. The dictionary and the projection rule assign a set of semantic representations to each sentence and explain speaker's knowledge of the senses of the sentences. In this context we have to become familiar with basic *structural definitions* that determine semantic properties and relations of sentences. They explain how speaker who knows the senses of sentence, also knows what semantic properties relations it has. Also, semantic component contains a set of *interpretive definitions* that provides logical interpretation for the semantic structure, characterized in the corresponding structural definition.

The full set of interpretive definitions is the *theory of (type) reference competence*, a theory of what the speaker knows about referential structure of language. This theory challenges the claim that complete theory of language requires both, theory of compositional structure for intensions and one for extensions. The theory of token reference is an explication of the performance principles underlying the speaker's ability to use the language to refer to things in actual speech situations. The important thing is that *token reference* is based not only on the meaning of words, but also on extra grammatical beliefs about the world. Of course, causal theorists deny the distinction between these two types of information, and some of them think that there are two concepts: phenomenological (or linguistic) and scientific one. This thesis is strongly rejected by Kripke, but he does not argue against independent linguistic concepts (in that case it would be necessary to show that there could be no principle like IP/intensional principle). Rather, he takes that linguistic concepts are the same as scientific concepts, but different in the degree of scientific sophistication. The reason is because for many empiricist philosophers, the language/theory distinction is not made sharp. But, if this distinction is made, linguistic and scientific concepts are immediately seen to be different in kind. It is important to note that *linguistic concepts* comprise the meanings of sentences we use to *communicate* (in language), and *scientific concepts* comprise the theories we use to *explain* the behavior of things (in the world).

⁶ The possible method is that of Jerrold Katz, and his method presupposes three steps: 1. setting out enough of the underlying theory of semantic competence in order to show that type reference comes under this theory; 2. establishment of a new model of how speaker use common nouns to token refer; and 3. presentation of how the user of proper nouns can be brought under this model without unnecessarily complicating it.

So, we may distinguish between *the meaning of word in the language* and *the meaning of word in the sentence*. If this distinction is drawn, then from the fact that proper noun has no meaning (in the language) it does not follow that it has no meaning in sentences. The possibility of its obtaining a derived meaning from its intra sentential relations to other words is immediately presupposed. The occurrence of such derivative meanings has been studied in linguistics in connection with *pronouns*, and here we deal with semantically empty words (it or something). Semantically empty pronouns obtain their meaning within the sentences. This derived meaning must come from the other words in the sentence, since there is nowhere else it might come from. But, there is a problem of *semantic deviance*, which occurs when principles that determine the meaning of sentence (from the meaning of its parts) are unable to combine meaning to form even one sense for the sentence. Any potential sense of the sentence is blocked at some level of compositional construction, and restrictions blocking the combination of senses determine the degree of ambiguity in sentences.

According to some authors (e.g. J. Katz) *Kripke's causal theory* may fit into the neoclassical theory. We can assume that the notion of the bearer of the name is not semantic primitive, and then the question is how it can be explicated in semantic theory. Kripke's theory provides a hypothesis about what this explication is, and in *Naming and Necessity* he gives example of initial baptism: the object can be named by ostension, or the reference of the name may be fixed by (non synonymous) description. He says that when the name is 'passed from link to link', the receiver of the name must intend (when he learns it) to use it with the same reference, as the man from whom he heard it.

1.2. Causal Theory of Linguistic Representation

Kripke's causal theory could be explained within the course of *causal theory of linguistic representation* in general. It is necessary to precise what kinds of **causal theories** we have, and to consider the basic relations they involve. The common opinion is that we have the following causal theories: *causal theory of knowledge and memory*, *causal theory of belief*, *causal theory of evidence*, *causal theory of proper and common names*, and *causal theory of reference*. All these phenomena should turn out to have not just causal analyses, but to involve particular *relation to an object*. The relation of „*involvement of an object*“ is what should be understood as a *causal relation*. In this case, the entities that share the property of involving an object, or involve such causal relation, may be conceived as sharing a common nature. This means that, in each case, what stands in causal relation may be conceived as being the **representation**, and if this is so, it follows that *representation is an essentially causal phenomenon*.

We can make supposition only about things with which we are acquainted or which are directly presented to us. It follows that the things represented to us are things of which we can form representation. Object may be represented by representations of representations of representations, and then it is distant from our representation of it and we are far from being immediately acquainted with it. But, even at such distance it is represented to us and it may figure as object of our psychological states (and our linguistic expressions of those states). A thing's being represented to us is sufficient to account that we know the thing about which we make supposition. Two important questions may arise here: if such representing relation is sufficient, why should there have to be causal connection between the thing and the representation of it, and what makes this relation causal. The fundamental thought here is that our states having objects (our perceptual states, beliefs, desires, intentions, fears) are responsible for the success with which we occupy the world. The objects involved in those states are the very constituents of the world and, therefore, world *determines* that these states exist, and conclusion is that this determination is causal determination (this idea is natural and realistic, but not for philosophers skeptical about the causal necessitation).

Our main attention is directed to *causal theorists*, and we have to investigate what *specific kind of causal relation* is, and this is the first task. A second task is to deal with *vacuous (empty) expressions* like „Santa Claus“ or „the planet Vulcan“, expressions that designate no existing thing. These tasks are one and the same task. If it is possible to state sufficient condition for expressions to refer to something then it is possible to state the condition lacking in expressions that refer to nothing. This is one of the virtues of the *orthodox theory of reference*. According to orthodox account, expression refers to object by virtue of the fact that the expression expresses the set of properties (instantiated by that object). If there is no object that has these properties, nothing is referred by expression, and that is what *vacuity* is. So, what is wrong with the orthodox condition is that its satisfaction is neither necessary nor sufficient for expression to refer to given object. *It is not necessary* because there is a class of expressions (names) that have no meaning and express no properties. It is possible to refer to something (by name or description) *wrongly*, and when it happen the expression (used to make the reference) does refer to that thing, and this means that the *condition is not sufficient*.

Accent on reference and representation is not strange since the core concern among contemporary analytic philosophers of language is reference, along with related issues of meaning and truth. Reference includes underlying semantic and pragmatic features of language.⁷

⁷ Ibid. R. Burch, for example, in his essay *James and the 'New Theory of Reference'* says that there are important features of the causal theory of reference (or theory of direct reference), which is usually associated with Kripke. The first feature is that the referential unit is considered to be an act, a speech-act, or writing-act, or

Having analyzed the *descriptivist (cluster) theory of reference* and found it „wrong from the fundamentals“ Kripke proposed a „better picture“ of how reference takes place. He said that our reference depends not just on what we think ourselves, but on other people in the community, the history of how the name is reached. It is by following such history that one gets to the reference. This better picture is the casual theory of (direct) reference, which Kripke explains by *thesis of initial baptism*.

The sense in which it is the *causal theory of reference* is that *the passage of name from link to link* is said to secure a causal connection between the name of object and the object. The initial baptismal act of naming the object *establishes the causal connection* in the first place, while the later uses of the name must be connected to the object by causal chain. It follows that Kripke does not explicitly propose the theory of reference. Others have attempted to forge causal theory of reference based on Kripke's picture, and according to them the central idea of causal theory of names is that our present uses of name, say 'Aristotle', *designate* the famous Greek philosopher *not in virtue* of various things we believe of him, *but in virtue* of causal network, stretching back from our use to the first use of name to designate Aristotle. Our present use of name *borrowes the reference from earlier use*, and this social mechanism enables all of us to designate the same thing by name. Regarding the claim that *reference is speech-act*, Kripke insists that there is clear difference between *semantic meaning* (referent) *of term/name* and *speaker meaning* (referent). Important connection is that between reference and truth: terms/names refer but they are not true, and sentences are true but they do not refer. This is the reason why Kripke does not discuss the truth (theories of truth) in representing his picture of reference. For him this thesis simply is not necessary, and the main question here is whether the truth of sentence depends upon the successful reference of its terms. It is common opinion that any theory of reference must be connected with the theory of truth, and this is exactly one of the differences between the others and Kripke. We may sum up the most important points of Kripke's *causal theory of proper names* as follow:

- the *meaning* of proper name is the individual to which, in the context of its use, the name refers,
- the name's referent is originally fixed by baptismal act, where name becomes a rigid designator of the referent,

(possibly) a mental act. The second feature is that the doctrine of reference goes hand in hand with a doctrine of truth. This is as it should be, since the truth of an assertion obviously depends in some strong way on the successful accomplishments of the assertion's referential acts. The third feature is that reference is established by something like causal or referential chain, as exemplified by Kripke, rather than being established by some sort of „inner, mental act of pointing that hits its target automatically.“ There are other features such as Kripke's thesis of names as rigid designators, not anticipated by others.

- later uses of the name succeed in referring by being linked by causal chain to the original baptismal act.

The theory is usually advocated by philosophers who deny that there is anything like Fregean *sense* attached to proper name. In order to give the meaning of proper name, we *don't* have to express the sense, we *don't* have to give identifying description of the individual that bears the name. In order to say what name means, we have to account for what causes proper names refer to the individuals to which they refer. We have to explain how proper names come to refer to the individuals that they do refer to. The answer is in original baptismal act, and causal chain, which means that all proper names get their meaning, their reference is fixed, or made *rigid*, as Kripke says. So, it's not the *sense* of the name, not any *particular set of properties* of some person that we use to refer to that person. Kripke points that those properties might change – they might have been totally different, but that person would still be that person. In fact, we can refer to someone without knowing anything about him. So it's possible to refer to someone without knowing the *sense* of its name.

1.3. Philosophical Foundations of the Theory of Communication

To communicate is to cause other persons to have thoughts, beliefs, feelings, attitudes, we wish them to have, and the main interest concerns the *saying what one believes or thinks about*. Language is *thinking device* which has an *ontological dimension*: the structure of sentence corresponds to the structure of fact, proposition thought with sentence, some parts of sentence correlate to certain parts of proposition. Language is also a *communication device* which means that we can display the facts, or at least the structure of what we believe or think about. This is the most fundamental presupposition of communicative speech known as *saying*. The main purpose is to understand *the nature of saying* which brings together thought and reality through language, to understand linguistic mechanisms that make saying feasible, and to discover and consider the limits of those mechanisms. The study of those mechanisms and their limits is known as *onto-logic of saying*, and this study includes a part of saying which consists in referring and that consisting in predicating/attributing properties or relations.

In order to explain the role of proper names it is necessary to become familiar with notions of *propositional* and *referential opacity*. As we know, proposition is either true or false, stands in implication relations to other propositions, and it is possible content of cognitive or purely intellectual acts (believing, supposing, considering something whether it is the case or not). Claim that proposition is the content of the attitude of certain person means that proposi-

tion is in the mind of that person. The ultimate aim of primary (interpersonal) communication is the discovery of propositions in the mind of some person in order to make it possible to others to apprehend them. This is precisely the fundamental function of language as a means of communication. If full communication is to be attained the language must contain *cognitive verbs* that appear in grammatical constructions that fully reveal the content of proposition/s used. The use of cognitive verbs in such constructions, and the constructions themselves, are *propositionally transparent*.⁸ Beside this we have *referentially opaque* constructions (Quine, for example, points that they are logically problematic, but from the point of view of philosophical foundations of the theory of communication, they are the fundamental contexts). The essential opacity of *proper names* is *propositional opacity*. Expressions that have the maximum degree of *referential transparence* are proper names. Being a genuine proper name is not property of an expression like „Petra“, but property of certain tokens or uses of such an expression. The name is used (on some occasions) without intention of predicating any property in the act of uttering the name. Genuine names in *direct discourse expressions*⁹ have a sense – because they signal the place of sense in proposition, and a reference – because they signal the place of reference in proposition. But, since they are not internal parts of language it follows that genuine names have neither sense nor reference. So, the role of proper name, especially in *direct discourse*, is not semantical but *causal*, and psychophysical. In fact, proper names have Fregean-like property: they can be genuine names in *direct discourse* and function as *quasi-description* in *indirect discourse*. As far as definite descriptions are concerned, they are (in *direct discourse*) both propositionally and referentially transparent. But, their propositional transparence allows that they contain proper names or propositionally opaque contexts.

Having all this in mind, we may notice that what we have here is not just distinction between *two kinds of names*, but also distinction between *two uses of names* (direct and indirect discourse). In the sense of the latter distinction, we spoke of *causal*, and not semantic, *role of genuine names*: speaker *uses* name to *cause* his hearer to apprehend proposition/s. Here we deal with classical 'sense view' concerning the proper names, criticized by Kripke who argues that in using a proper name the successful reference is possible even when the speaker

⁸ For example, the sentence „Petra believes that $3+1=4$ “ reveals that this is the proposition which is in her mind as the content, or objective, of her belief. In „Petra believes that $3+1=4$ “ the clause „ $3+1=4$ “ is *propositionally transparent*, and the same holds for „3“, „1“, „ $3+1$ “, and „4“.

⁹ It is distinction between indirect and direct discourse. Indirect discourse, also called *oratio obliqua*, is the use of the words to report what others say but without direct quotation. In indirect discourse one can use other words to report what that person said, and that words capture the sense of someone's assertion. For example, when we say „Petra believes that some doctors are not honest“, we use 'some doctors are not honest' to present the proposition that Petra believes. On the other hand, when we say „Petra said: 'Not every doctor is honest'“ we use the direct discourse to make an assertion about what Petra said. Direct discourse is also called *oratio recta*.

fails to possess correct (uniquely) identifying characterization of the referent. We can refer to *a*, assert and apprehend propositions about *a*, even though we do not possess single correct identifying description of *a*. According to *classical 'sense view'*, proposition in speaker's mind (when he uses proper names) contains a 'mode of presentation' of the referent as a subject-constituent. According to *Kripke's account*, the speaker might not identify the characterization which could be such subject-constituent. Although Kripke refers to the chain of communication as causal, he speaks more about the fact that the name has been passed 'by tradition from link to link', and in this context the causal aspect is not important. *Kripke's causal theory of proper names* belongs more to the attribution of reference regarding the process of communication.

2. Comparative Analysis

2.1. Carnap and Kripke about Meaning and Modality

2.1.1. Carnap's Syntax

In his syntax Carnap has considered philosophical theses and questions showing that we can translate them from the commonly used material mode to the formal mode of speech. The translation shows that philosophical questions and theses in fact belong to syntax, but the question is whether the same considerations applies to all other problems of philosophy (philosophy is understood as to include neither metaphysics nor psychology). Here Carnap regards *epistemology* or theory of knowledge. Once ethics and aesthetics are set aside (they are not descriptive), philosophy is understood as theory of knowledge. To Carnap, knowledge is obtained through scientific activity and constructed in science, whose sentences form scientific language. Therefore, philosophy is the study of scientific knowledge, and this is nothing more than the study of scientific language. In this way many philosophical opinions can be seen as proposals for the construction of scientific language. In its usual form, epistemology contains both psychological and logical questions. Psychological questions concern the procedure of knowledge or mental events, by which we come to know something. If we put aside these questions and leave them to psychological-empirical investigations, what remains is *logical analysis of knowledge*. Logical analysis of knowledge includes examination and verification of assertions, because knowledge consists of positively verified assertions. Epistemological questions of this kind can be expressed in the formal mode, and the argument for this claim Carnap finds in the fact that epistemological analysis (the method of verification of

given sentence) has to refer to *observation sentences* deducible from the given sentence. He concludes that logical analysis of verification is syntactical analysis of transformation rules which determine the deduction of observation sentences, meaning that *epistemology*, after the elimination of its metaphysical and psychological elements, *is a part of syntax*. So, all these questions must be treated by special science, but the main issue is how to resolve the old problem of *a priori knowledge*. Carnap didn't recognize the *a priori – a posteriori distinction* since he didn't recognize modal character which makes *a priori* epistemological. Without this character, the notion becomes empirical and metaphysical. To resolve this problem he displaces the problem of *a priori* from epistemology to logic, where it can find an adequate solution. Classical epistemology, on the other hand, was considered as a mixture of applied logic, psychology, and metaphysics. It may seem strange that metaphysics is included in classical epistemology, but this was deliberate since Carnap wanted to evaluate his syntactical doctrine independently of the acceptance or rejection of metaphysics.

Natural philosophy was interesting branch of philosophy too, and Carnap emphasized that the task of natural philosophy is not philosophical investigation of nature: the object of scientifically treated natural philosophy is not nature, but the natural sciences, and its task is logical analysis of science, or the *syntactical analysis of the language system of science*. Physical language, in which we speak about physical things in everyday life or in physics, for Carnap was of the great importance. *Vienna Circle* philosophers held the opinion that physical language is the basic language of all science, universal language comprehending the contents of all other scientific languages. This means that every sentence of any branch of scientific language is equipollent to some sentence of physical language, and therefore can be translated into the physical language without changing its content, and Neurath was first who has proposed to call this thesis *physicalism*. In close connection with physicalism is the thesis of the *unity of science*, which is one of the main goals of Carnap's philosophy: if every sentence can be translated into philosophical language then it is universal language of science, which implies that all scientific terms are of logically related kinds. Carnap's reference to the uniformity of objects was reference to the usual mode of speech: we must speak not about objects but about terms, which lead to conclusion that the terms of all branches of science are *logically uniform*.

The method of logical syntax, as the analysis of the formal structure of language comprehended as the system of rules, is the only method of philosophy, and therefore it provides the explanation by use of logical reconstruction (made in model languages having well-defined formation and transformation rules, explainable in an adequate meta-language).

The objective of logical syntax is to establish the theory of language as rigorous and demanding as scientific theory. The discussion about languages is meaningful and its propositions are *analytic*. The logical syntax is therefore a *purely analytic theory of the structure of expressions of language*, which includes specification which expressions form a part of it, and what inferences are admissible in it. Once this has been done, there is a room for philosophy which can be expressed in meaningful sentences. This means that philosophy is no longer activity exercised through pseudo propositions. If philosophy studies scientific knowledge then its sphere can be reduced to the study of scientific language. Since philosophy deals with language of science it represents the logic of language of science (philosophers deal with both pure and applied logic).

In his syntax Carnap gave no adequate account of *meaning* and *modality*, and therefore he supplemented his syntax by semantics, in order to provide the adequate definition of meaning, carried out through his method of extension and intension, method of the name relation, and especially his concept of compositionality. His **method of extension and intension** is method of semantical meaning analysis or semantical analysis of meaning of expressions. The specific kind of expressions are *designators*. The main role plays his **principle of compositionality**, and it is important to deal with the logical role of compositionality, especially within the context of extensionality and intensionality. The reason is that the structures relevant to logic must be created in compositional way. What is meant by the compositionality is that the meaning of complex expression is determined by the meanings of its constituents and its structure: *the meaning of complex expression is function of the meaning of its constituents*. Meaning of complex expression is built up from the meaning of its constituents, and that provides that in the case where two expressions have the same meaning, the substitution of one for the other in a third expression does not change the meaning of the third expression. Taking in this way, the principle of compositionality implies the *principle of substitutivity* (Quine's principle). The principle of compositionality works on the level of natural language, which means that logical structures have its origins in natural language. Carnap pointed out that logical structures originate from natural language, based on compositionality of natural language: logical laws get meaning through primitive structures and natural language meanings. After the distinction between *grammatical* and *logical structure* it was obvious that it works on the level of logical investigation as well, or as *logical compositionality*. This means that principle of compositionality is duplicated with respect to *reference* and *sense* of complex expression.

Carnap concludes that *intensions and extensions of predicates* are extra-linguistic entities, since properties of individual and classes of individuals have to do with the individuals,

not with expressions. The same holds for *extensions and intensions of individual expressions*, individuals and individuals concepts are extra-linguistic entities. This holds also in the case of *intensions of sentences*, propositions. The main question is what kind of entities are the truth-values, which we take as extensions of sentences. The truth-values have to be understood in their semantical sense: truth is property of sentence. Truth depends upon extra-linguistic facts and its definition must refer to extra-linguistic entities. Carnap here is not concerned with this question, but rather with that of kind of entity to which the concept of truth belongs.

In general, there are two alternative versions of Carnap's semantical method. According to *first* version, every designator refers to both extension and intension. It follows that every sentence can be directly interpreted in terms of intensions and extensions. But, this is not correct. Ordinary extensional sentences may be interpreted directly in terms of extensions, but only indirectly in terms of intensions. Intensional sentences may be directly interpreted intensionally but not extensionally. According to *second* version intensions alone are admitted as entities and may be called 'neutral entities'. Extensions are retained in ontology of the metalanguage to explain terms like 'equivalent', 'designates', and 'have the same extension'. This version depends upon altering two principles of interchangeability, the principle of subject matter and the principle of substitutivity. This version allows the distinction between extensions and intensions to be dropped entirely. The main purpose of regarding this method is because Carnap's considerations about modalities presuppose the whole theory of extensions and intensions. His step of reduction of extensions to intensions is not surprising since system with modalities is intensional.

Carnap analyzed **the method of the name relation** which regards expressions as names of entities. The three main principles are important here: *the principles of univocality*, *the principles of subject matter* and *the principles of interchangeability*. This method is just another attempt to provide an adequate account of meaning within the context of name. But, this method suffers from serious disadvantages known as antinomies of the name-relation (especially concerning the third principle), Carnap proposes a several ways to eliminate the contradiction, offering arguments in favor to his method.

On the account of such comprehensive analysis Carnap tries to represent his *logic of modalities*. He uses his semantic to define the basic notions of modality, trying to provide a full account of meaning analyzed in modal context respectively. Connection between meaning and modality can be found in his explanation of *analyticity*, which comprises both meaning and modality/necessity. In this context the important role has the three-fold distinction on metaphysical, semantical/logical and epistemological facts.

2.1.2. Carnap: Analyticity and Meaning

The *concept of analyticity*, or rather the *concept of analytic proposition*, was often brought forward only to be contrasted with that of real or empirical proposition, and dismissed as verbal (according to J. S. Mill¹⁰) or frivolous (according to J. Locke¹¹), or to be contrasted with other kinds of necessary truth (according to I. Kant¹²). These formal lacks led to the conceptions of analyticity restricted to narrow classes of sentences, identities (typical for Leibniz¹³), or subject-predicate sentences (typical for Kant).

To analyze analyticity more deeply, it is important to regard three main concepts that form a system of classification, which plays a crucial role in philosophical theorizing. Those concepts are: the first pair – *necessity and contingency* (in the context of truth), the second pair – *analytic and synthetic* (in the context of statement) and the third pair – *a priori and a posteriori* (in the context of knowledge). This issue was important in traditional philosophy especially since I. Kant who is the first who realized the importance and significance of distinguishing between metaphysical, semantical and epistemological facts. He believed that there was a class of truths that were synthetic but knowable *a priori*, and that the root of many of Hume's sceptical conclusions in his philosophy (concerning causation particularly) were due to his distinction on relations of ideas and matters of fact. In the contemporary philo-

¹⁰ According to Mill we have *verbal* propositions, but this does not mean that they are expressed in words as opposed to other signs, or that they are about words. This means that they can be evolved from the meaning of the terms used, i.e. they can be asserted without any investigation of non-linguistic facts. Verbal propositions are also known as essential propositions („Man is rational.“), where the predicate is the definition or part of the definition of the subject. These propositions either give no information or give it respecting names not things. Obviously, verbal propositions are supposed to be those which Locke called frivolous or trifling and Kant analytic.

¹¹ According to Locke, all deductive reasoning can be reduced to Aristotle's rules. He regarded syllogisms as useless for discovery, and they serve only for verbal fencing. As far as identical statements are concerned ('A is A') and statements in which part of any complex idea is predicated of the whole, they are frivolous or trifling. Real instructive knowledge, such as we have in mathematics, cannot be gained by mere explication of definitions, but must be derived from intuition of relations between ideas.

¹² The idea of the distinction between analytic and synthetic judgments seems to be derived from Locke's discussion of trifling and instructive propositions, but in Kant's system this distinction is fundamental. He refers to judgments of the subject-predicate forms. In one place of his *Critique of Pure Reason*, he said that the fundamental and sufficient principle of all analytic judgments is the Law of contradiction or rather the Law of non-contradiction. This means that a judgment is analytic iff its negation is conjunction of contradictories. Such characterization of analytic judgments is quite suitable for Kant's purposes since it is possible (with this definition) to divide all true judgments on 'analytic' and 'synthetic'. But, it would be mistake to suppose that a class of analytic judgments so defined includes all judgments that are true on logical grounds alone.

¹³ Leibniz has assumed a distinction between the method of exposition, which is synthetic, and the method of discovery, which is analytic, but this distinction disappears in time from his writings. At the beginning, he regarded all necessary truths as truths guaranteed by the definitions of their terms, and that there are no absolutely indemonstrable axioms except the *principle of identity*. So, to prove proposition means to show that its predicate concept is contained in its subject concept and it is necessary to analyze these two concepts to make their relations clear. But, it seems paradoxical to say that all necessary truths depend on definitions made by us. Leibniz admits this, but he does not regard definitions as wholly arbitrary. A real definition (as distinct from nominal) contains an implicit assertion of the possibility of that which is defined. The next problem is that it is not quite clear what word 'possible' means in this context. Namely, if we agree that a necessary truth is one whose negation would be formally self-contradictory, then it is natural to assume that 'possible' means the same as free from formal self-contradiction.

sophy, this problem is presented in opposite manner, and as we have seen Kripke argues that some necessary truths are only discoverable *a posteriori*: it is the astronomical discovery that the morning star is the same heavenly body as the evening star, and that both represent the planet Venus. This is empirical discovery without any *a priori* cogitation. In Kripke's opinion this is necessary fact, and he points that the identity statements are guaranteed by logic (to be true in every possible world). Everything is the thing it is and not some other thing, every object is necessarily self-identical. This short analysis of analyticity, presented in virtue of other relevant concepts (necessity and *a priori*) is background and introduction to Carnap's explanation of modality and analyticity.

So, Kant's distinction between *analytic* and *synthetic truths* has its origin in two basic distinctions: Hume's distinction on *relations of ideas* and *matters of fact*, and Leibniz's *truths of reason* and *truths of fact*. Truths of reason as true in all possible worlds means that the truths of reason are those which could not possibly be false, and similarly, analytic statements can be defined as those whose denials are self-contradictory. On the other hand, Kant has conceived an analytic statement as one that attributes to its subject no more than is already conceptually contained in the subject alone. This presupposes that Kant limits himself to the subject-predicate statements and to the notion of containment.

It is obvious that the concept of *meaning* is presupposed. But meaning cannot be identified with naming and Frege's example of „evening star/morning star“, and Russell's „Scott/the author of Waverley“ illustrate that *terms/names can name the same thing but differ in meaning*. The distinction between meaning and naming is no less important at the level of abstract terms. Whereas singular term purports to name an entity (abstract or concrete), general term does not, but general term is true of an entity (or of each of many, or of none). The class of all entities of which general term is true is called the *extension of the term*. Meaning is also called *intension*. So, what we have here is important *distinction between intension and extension*, established by Carnap. Confusion of meaning/intension with extension in the case of general terms is less common than confusion of meaning with naming in the case of singular terms. It is commonplace in philosophy to oppose intension/meaning to extension or *connotation to denotation*.

But, one may ask in what way the theory of meaning is relevant for the problem of analyticity? Once the theory of meaning is sharply separated from the theory of reference¹⁴, it

¹⁴ It is usual to think that referential relations hold between language and thoughts on one hand, and the world on the other hand. The most striking example of such relation is the naming relation, which holds between name and object. Some philosophers restrict the word 'reference' to *naming relation*, and others cover the range of semantically significant relations that hold between various sorts of terms and world. Other words (used for

becomes obvious that the primary task of the theory of meaning is to analyze the synonymy of linguistic forms and analyticity of statements.

The problem about the *analyticity* can be traced back to Frege, who was the first who tried to articulate the central notions of classical quantificational logic, in attempt to find ultimate justification and clarification of mathematical truths, provided by reduction of most of mathematics to logic. In this context he deals with the problem of analyticity as well, and question is why such reduction to logic should/could bring more illumination than reduction to any other part of mathematics. His answer was that logic's subject matter is not any particular range of truths, but truth itself, and that logic is concerned with how the truth of any statement is related to the truth of others, or with the nature of inference. Taking this conception of logic, Frege held that questions about justification that might be raised with respect to analysis could not be with respect to logic. In other words, logic articulates what justification is, and to ask whether something is justified is to presuppose certain canons of justification – and this is just to accept logic.

Psychologism in logic is important especially with respect to the concept of analyticity. Way? Well, psychologism in logic is the view that propositions, properties, and relations are mental acts or dispositions, and hence that logical terms like true, valid and analytic, must be applied primarily to mental entities. In certain way, psychologism furthered the confusion of self-evidence with analyticity, and provides no precise characterization of the analyticity by making it appear to require final knowledge of the mind. Psychologism stands in the way of grasping the possibility of defending analyticity in terms of explicit linguistic convention. The escape from psychologism was taken by Frege by his inclusion of precise formation rules, specifying the admissible sentence structure (in his *Grundgesetze*). He made a sharp line between the sentences *in* the system or *object language*, and the sentences *about* the system or *metalanguage*. This was made explicit by Tarski¹⁵, but received its fullest formulation by Carnap, and it is not surprising that Carnap has inherited some core aspects of Frege's

one or other of these relations) include 'designation', 'denotation', 'signification', 'applications', etc. Philosophers often are interested in *reference*, since they take it to be the core of meaning. For example, the fact that 'Socrates' refers to the famous philosopher is the core of the name's meaning, and hence of its contribution to the meaning of any sentence that contains the name. The name's referent contributes to the sentence's meaning by contributing to its truth-condition. The central question about reference is that of in virtue of what does a term have its reference? Answering this requires a theory that explains the term's relation to its referent.

¹⁵ A. Tarski made distinction on object language and metalanguage, especially in the context of his theory of truth. According to him, if we want to develop a satisfactory theory of truth our metalanguage must be richer in expressive power than the object language. Metalanguage is used to describe object language, which may be either natural or formal language. Since the goal of formal semantic theory is to provide an axiomatic or otherwise systematic theory of meaning for the object language, it is clear that metalanguage is used to specify the object language's symbols and formation rules, which determine its grammatical sentences of well-formed formulas, and to ascribe meanings or interpretations to these sentences or formulas.

conception (directly and via Russell and Wittgenstein). Carnap insisted on fact that there was not just single logic and the development of intuitionism and intuitionist logic contributed to his view that there are many different collections of rules for the use of language, which he called *linguistic frameworks*. Linguistic frameworks *correspond to different meanings* that can be bestowed on words, and they legitimate *different principles of inference* and *different conceptions of justification*. Carnap defends his famous *principle of tolerance* with respect to linguistic frameworks maintaining that scientists should feel free to adopt the most convenient linguistic framework for their particular needs. He makes difference between *choices of framework* and *choices made within a framework*, or between framework-external and framework-internal choices, depending on pragmatic or theoretical reasons for choosing one or another linguistic framework. Carnap holds that many traditional philosophical questions are best understood as framework-external ones: as such, they have no correct answer and they are cognitively empty or metaphysical. Why this framework difference is important for the problem of analyticity? The reason is because there is a certain *connection between linguistic frameworks and analyticity*. Namely, when scientist adopts a linguistic framework some sentences come to be true by virtue of the framework's rules, and those sentences are analytic truths. On the other hand, those sentences whose truth must await the world's verdict are synthetic truths. If the rules of linguistic framework can be taken as specifying the meaning of words, then *analytic truth* is a sentence that is true by virtue of the meaning of its words, and *synthetic truth* is a sentence whose truth owes to something more than just to the meaning of its words.

So, the distinction between framework-external and framework-internal assertions and the distinction between analytic and synthetic truths Carnap takes as very important. But, question that arises here is about the criteria for distinguishing analytic from synthetic truths. Interesting and important answer is offered by Quine¹⁶ whose first request/argument is that it is necessary to provide an explication of analyticity in terms of other notions such as analyses that employ the notions *synonymy*, *intensional context*, *semantical rule*, etc. The question is whether the explanation of analyticity in virtue of these notions is of greater clarity, or is it sufficient. Second request is that it is necessary to articulate observable behavioral criteria that will resolve whether given sentence is analytic or not (in speaker's language, of course). Namely, the sentence is analytic in the speaker's language if there is no experience that would lead the speaker to abandon it, and synthetic if there are. Quine holds that logical truths of

¹⁶ W. V. O. Quine, „Two Dogmas of Empiricism“, in his *From a Logical Point of View*, Cambridge, MA: Harvard, University Press, 1953, pp. 20-46.; „Carnap and Logical Truth“ in *Synthesis*, 1960.

language are infinite and all cannot be listed explicitly, and therefore we have to isolate a finite set of such truths called „axioms“ or „axiomatic schemes“¹⁷. He claims that logical truths comprise the axioms and any truth derivable from them. The distinction between what counts as logical rule of inference and what does not, is already understood. Also, it is possible to specify a set of logical rules of inference as well, but in doing so it is necessary to assume that the distinction between how those rules are applied to the axioms and how they are not is already understood. The way in which analytic truth contributes to the organization and prediction of experience is different from way in which synthetic one does. In fact Quine differ two classes of analytic statements: the first class are logically true statements or logical truths, and the second class depends on the notion of synonymy. This view has to serve as background for the analysis of Carnap’s reasons for his rejection of the above mentioned arguments.

With respect to *first request/argument*, Carnap holds that the notion of analyticity can be explicated by reference to the concept that is not cognate to it. But, the question is whether he really holds this? He agrees with thesis that there is a *family of interdefinable notions* such as *analyticity*, *synonymy*, *necessity*, etc., but rejects the claim that this bears negatively on the notion of analyticity. He points out that if the interdefinability is taken as argument against the entire family of interlocking notions, then we could reject the concept of truth, but he was not prepared to do so. It follows that first argument is accepted by Carnap, but its relevance to analytic-synthetic distinction is denied.

Turning to the *second argument* it is possible to ask whether Carnap rejects it, since he held that analytic truths could never be given up, or that there is no rational reason to abandon such truth. The basic question is whether Carnap holds Quine’s *dogma of reductionism*, and so believes that statements, taken individually, have empirical content. Quine claimed that the analytic-synthetic distinction and the dogma of reductionism have the very identical root, and he rejects reductionism in favor of *holism* (the doctrine according to which only collections of statements yield observational consequences). It seems that precisely this forms the basis of their disagreement. To Carnap, we can choose to employ a different linguistic framework, and as a consequence, we can always alter the truths that count as analytic. Thus, Carnap agrees that *revision* can strike anywhere (no rule of physical language is definitive) and that all rules are laid down so that they may be altered as soon as it seems necessary to do

¹⁷ An axiom-schema or rule of inference is a rule for transforming a set of well-formed formulas into a formula, where that rule operates only upon syntactic information. It was this conception of an axiom-schema and rule of inference that was one of the keys to creating a rigorous science of deductive reasoning. In 1950’s, the idea was imported into linguistics, giving rise to the notion of transformation rule. Such a rule transforms tree structures into tree structures, taking one from the deep structure of a sentence – which determines its semantic interpretation, to the surface structure of that sentence – which determines its phonetic interpretation.

so.¹⁸ This applies not only to physical but to logical rules as well. In this respect, there are only differences in degree: certain rules are more difficult to renounce than others.

In general, Carnap holds that any statement can be safeguarded from revision, and he accepts that any statement can be held true come what may. But, the concept of analytic statement which he takes as *explicandum*, is not adequately characterized by „held true come what may“. ¹⁹ It is wrong to think that he embraces reductionism, and he is explicit that an empirical test applies, not to single hypothesis, but to the whole system of physics as a system of hypotheses. He insists that *the existence of analytic truths should not be expected to have any empirical consequences*. In other words, he allows that experience is irrelevant to the justification of some truths but not others. To view this thesis as having the observational consequences is to view it as involving an empirical claim. But, from Carnap's perspective, the assertion that some, but not all truths, hold in virtue of the meaning of words, was never meant to be itself synthetic. He insists that the thesis is philosophical if it is not exposable to empirical test. He has tried to formulate behavioral tests for determining which sentences of speaker's language are analytic. The pre-systematic concept of analyticity is acceptable **explicandum**, and Carnap believed that Quine did not find the pre-systematic concept of analyticity clear. He appeals to *behavioral criteria* to characterize what the *pragmatical concept of analyticity* is, which could not to be identified with *semantical concept of analyticity*. He insists that the concept of analyticity has exact definition only in the case of language system or system of semantical rules, and not in the case of an ordinary language. The reason is because in the latter the words have no clearly defined meaning. For Carnap, pragmatical concept is not needed to legitimate the semantical concept, which has already proven its value (in order to be fruitful, semantical concept must not necessarily possess *a priori* pragmatical counterpart), and semantical concepts are intended as *explicata* for corresponding pragmatical concepts. Why these pragmatical concepts are important? Carnap holds that scientifically sound pragmatical concepts provides practical motivation and justification for the introduction of corresponding concepts in pure semantics, and by specifying pragmatical counterparts to semantical concepts it is possible to understand and appreciate the latter. If an empirical criterion for analyticity with respect to natural languages were given, then pragmatical concept could serve as *explicandum* for the reconstruction of purely semantical concept of analytic truth.

¹⁸ R. Carnap „The Logical Syntax of Language“, Amethe Smeaton (trans.) London: Routledge & Kegan Paul, 1937, p. 318.

¹⁹ „W. V. Quine on Logical Truth“, in Schillp 1963, pp. 921.

As we have seen, Carnap takes the claim that there are analytic truths to be philosophical one, and here he means on scientific philosophy, or *logic of science*. The work of philosophers, which may be held to be scientific in nature, consists of *logical analysis*, and such analysis, of which the distinction between analytic and synthetic truths is one important component, is a part of strict scientific discipline which studies the nature of science itself, without any empirical investigation of scientific activity. Claim that analyticity cannot be empirically tested actually establish one obvious thing, namely that Quine's arguments are meant as contributions to scientific philosophy, and not to empirical science. Why this is important? This shows that Quine draws no such distinction between empirical and scientific philosophy, for him there is nothing beyond empirical science that counts as scientific activity.

It is important to remind that Carnap explains the analyticity by appeal to *state-descriptions*, considered as an exhaustive assignment of truth values to atomic or non compound statements. All other statements of language are built up of their component clauses, by means of familiar logical devices. This means that the truth value of any complex statement is fixed for each state-description by specific logical laws, and statement is analytic when it comes true under every state-description. To those who are familiar with the history of this problem, it become obvious that this account of state-description is an adoption of Leibniz's „true in all possible worlds“. However, this version of analyticity serves its purpose only if atomic statements are mutually independent, for example, sentences S1: „John is bachelor“ and S2: „John is married“. This means that otherwise there would be a state-description which assigns the truth to S1 and to S2. Consequently, S3: „No bachelors are married“, would turn out be synthetic rather than analytic statement, under the proposed criterion. So, the criterion of analyticity in terms of state-description serves only for languages devoid of extra-logical synonym pairs. We may conclude that this criterion, in the terms of state-description, is reconstruction of logical truth but not of analyticity. Since the main problem is analyticity the major difficulty lies not in logical truths (the first class of analytic truths) but in second class of analytic truths that depends on synonymy. For Carnap, to accept that there are analytic truths is just to accept that there are truths that are evidentially disconnected from experience, or that there are truths that say nothing about the world, and that they are nothing more but clear recognition of meanings (or meaning relations). Consequently, to reject the analytic-synthetic distinction is to reject that there are any truths beyond those to be known in the course of systematizing experience.

So, is there a useful philosophical distinction between analytic and synthetic truths, and does analyticity help to explain *a priori* knowledge? Carnap began with analyticity, and took

that semantical claims have no empirical substance trying to reveal their place within scientific philosophy. The claim that some truths are analytic has no empirical content, and it is not intended to commit one to the existence of any kind of entities, or truth of any assertions about reality. Carnap insists that philosophical insight does not say anything about the world. Thus, in the context of his acceptance of analytic-synthetic distinction, *empiricism* is doctrine according to which justification of any synthetic truth must make reference to experience.

Carnap's development of analyticity is divided in two main phases: the first phase is *syntactical* and second is *semantical*. Syntactical phase involves the attempt to characterize the analyticity in a purely formal way, which is capable to represent forms of inference, which had previously been thought to rest on meaning alone. The entire syntactical system is built up by enumerative and recursive definitions²⁰. In his *The Logical Syntax of Language*, Carnap studies formal language which can express classical mathematics and scientific theories. In that time, in 1934, he was aware of the substantial difference between the concept of proof and concept of consequence, on the ground of previously published Gödel's work on the incompleteness of mathematics (thesis that some statements, in spite of being a logical consequence of mathematical axioms, are not provable by means of these axioms). In that time Tarski's essay on semantics still was not published so that Carnap did not know for logical theory of semantics of formal language, and this circumstance explains the fact why in his *The Logical Syntax of Language* he gives a purely syntactic formulation of logical consequence (after Tarski's essay, logical consequence was regarded as semantic concept and defined by means of model theory). Carnap also defines formation and transformation rules, the notion of provability, the new rule of inference, the notions of L-true and L-false, synthetic and analytic statements, the notions of *a priori* and *a posteriori*, etc. Showing that all logic can be syntactical and that syntactical system could formulate its own syntax, Carnap intended to show that all philosophically significant sentences about language could be made at least as precise as sentences in that language.

²⁰ The recursive definition is definition that proceeds in two steps: first step comprises a certain kind of enumerative specification of certain entities (individuals, numbers, classes) as being characterized by the defined term, while second step comprises a specification of one or more relationships to any known member entity which will qualify an entity in its turn as characterized by the defined predicate. The importance of recursive definition lies in the fact that it single out the class of entities which have no purely qualitative characteristic in common. In fact this is the reason why this sort of definition is ideal for the purposes of arbitrary or non-natural classification and constructions. Since the abstract entities have no purely qualitative characteristics, and since this method of definition provides an explicit method of proving universal sentences involving the defined class, recursive definition is a central constructive device of mathematics. The reason why we turn our attention to this is because Carnap's semantical concepts are of this type and this actually constitutes an important difference from syntactical concepts. In: *The Philosophy of Rudolf Carnap*, The Library of Living Philosophers, Vol. XI, ed. By P. A. Schilpp, Northwestern University, 1963.

In his *Testability and Meaning*, he defines that statement is *analytic* iff it is logically true, *self-contradictory* iff it is logically false, while otherwise the statement is *synthetic*. What becomes obvious is his use of semantic notions of truth and falsity. In his *Meaning and Necessity*, he gives similar definition, but with certain specification: first he defines the notion of L-truth – statement is L-true if its truth depends on semantic rules, and then the notion of L-falsity – statement is L-false if its negation is L-true. Accordingly, statement is L-determined if it is L-true or L-false, and analytic statements are L-determined, while synthetic statements are not L-determined. Under Tarski's influence Carnap accepted that analytic sentence is not provable in purely formal sense, and this means that it must be distinguished from theorems provable on the basis of synthetic laws, by being true in virtue of meanings. In his later works language is no longer conceived as syntactical but as semantical system²¹. In his *Meaning and Necessity* he proposed languages extended by modal concepts of necessity, possibility, etc., in such way that it becomes provable that propositions designated by *analytic sentences are necessary*.

The three-fold distinction on metaphysical, semantical/logical and epistemological contexts is recognized and it can be regarded from two distinct points of view. The **first view** consists in thesis that these three distinctions are clearly related, they appear to be coextensive or true of the same things, which means that it is possible to recognize and distinguish two kinds of object: the relations of ideas and the of matters of fact. This comprises a certain two-fold distinction between, on the one hand – necessity, analyticity and *a priori* (having its source in the relations of ideas), and on the other hand – contingency, syntheticity and *a posteriority* (having its source in the matters of fact). The significance of this two-fold distinction is expressed in Hume's *Enquiry*: all objects of human reason or enquiry may naturally be divided into two kinds, in *the relations of ideas* and *the matters of facts*. Of the first kind are the sciences of geometry, algebra and arithmetic, or every affirmation which is either intuitively or demonstratively certain. Consequently, propositions of this kind are discoverable by the mere operation of thought, while the matters of fact, the second objects of human reason, are not ascertained in the same manner. We might think that it is because of relations between ideas that we are able to understand the notions of *a priori* and necessity. This means that if there is a class of statements that are analytic (that express relations of ideas) then their truth value can be known independently of experience, or *a priori*, because their truth value is not determined by any facts about the world. If the truth value is not

²¹ Such semantical systems are built up like syntactical systems, namely by iterated enumerations and recursions. This means that no semantical term needs to be taken as primitive in order to construct semantical system.

determined by any facts about world then, no matter how the world was different, their truth value would remain unchanged, and therefore they express necessary truths. The **second view** is that there are some reasons for thinking that these three distinctions may not be coextensive. In fact, a further justification is needful to believe that all necessary truths must be expressible by analytic statements which are known to be true *a priori*. After all, three distinctions are distinctions about different kinds of facts, facts about necessary structure of world, facts about meaning, and facts about how we get the knowledge.

The question is which view fits under Carnap's point of view. It is certain that he accepts the analytic-synthetic distinction, and consequently the three-fold distinction. In his syntax-stage he talks about L-truth and L-falsity, analytic and synthetic statements, *a priori* and *a posteriori*. In his method of extension and intension, and especially in his logic of modalities and semantics for metalanguage, he deals with necessary and contingent truths. This distinction is about the different kinds of facts and accepts that these categories should not be mixed, and in that sense they are not coextensive. It follows that both views fit into Carnap's semantics and his intensional logic, and that these two views are not contradictory to each other.

2.1.3. Kripke: *Contingent A Priori and Necessary A Posteriori*

In his *Naming and Necessity*, Kripke challenges traditional connection between *a priori* and *necessary truths*, and *a posteriori* and *contingent truths*. He argues that there are **contingent truths that we know *a priori***, and **necessary truths that we can know *a posteriori***.

Contingent A Priori. In the case when someone fixes the reference of name by means of description, Kripke holds that such person can know a contingent truth by *a priori* means. His example of fixing the reference is that of 'meter': „The length of stick S at time *t* is one meter“ – we could use this to fix the reference of the length of a meter. When speaker did that, the given sentence expresses a *contingent truth* about stick S: it is *contingent fact* about S that it had the length it did at time *t*. Speaker can *know* that *a priori* because it knows it without making empirical investigation, and Kripke concludes that contingent truth can be known *a priori*. Can we take it for granted? We can accept that speaker knows some fact *a priori* and admits it as a contingent fact. But, the question is whether these two facts are the same fact? It is possible to claim that what person knows *a priori* is necessarily true, and if person knows the contingent fact about S's length, he knows it by ordinary empirical means. In other words, it is possible to argue that such sentence is ambiguous and has two readings:

- a. The length of stick S at time T is a certain length (39 inches).
- b. The length of stick S at time T is named „one meter“.

The ambiguity arises because sentence can be used to *describe* or to *name* stick S. When it is used to *describe*, it asserts that S has a certain length, and when it is used to *name* S, it doesn't describe S, it doesn't say that S has a certain length – it says that whatever length it is, it is given the name 'meter'. It is doubtful whether cases of fixing the reference give *a priori* contingent knowledge. The *a priori* method that Kripke suggests for knowing that stick S is a meter (naming S's length 'meter'), does not show that the length of S could be otherwise, it does not show that the length of S is contingent. Knowing that S's length is contingent, or that length could be otherwise, is an *a posteriori* affair. There is no implication that the length of S could be known by *a priori* means. In this case, Kripke was wrong to think that this sort of *a priori* knowledge could be knowledge about contingent matters, or *vice versa*.

Second or metalinguistic reading is what person knows *a priori*. The same argument holds for the other cases of fixing the reference mentioned by Kripke (water boils at sea level at 100 degrees centigrade, planet Neptune-case). So, the main objection is that there are two facts here: one that is contingent and known by *a posteriori* means, and other which is necessarily true and known by *a priori* means.

Necessary A Posteriori. Within the context of necessarily truth known *a posteriori* Kripke regards two cases:

- a. case that involves the *identity of an object named by two proper names*, e.g., that Hesperus is Phosphorus;
- b. case that involves the *identity of kinds*, e.g. scientific identity that gold is 79 protons.

a. Kripke's argument regarding identities with proper names

In the first case he argues that if Hesperus is the same object as Phosphorus then necessarily Hesperus is Phosphorus, and this is so because names are rigid designators. In other words, he uses 'Hesperus' and 'Phosphorus' as name of the same object in all possible worlds. So, if 'Hesperus' and 'Phosphorus' refer to same object, then they will refer to that object in every possible world in which it exists (which is another way of saying that necessarily Hesperus is Phosphorus). So, the fact that Hesperus is Phosphorus is something that has been discovered empirically, meaning that necessary truth is known *a posteriori*. We cannot deny that there is necessary truth, nor that empirical discovery has been made. But, the question is whether the empirical discovery is necessary truth, and again the problem of ambiguity arises.

Sentence „Hesperus is Phosphorus“ can express the necessary truth that object (planet Venus) is self-identical. On the other hand, it can express the contingent fact that the same object has been named 'Hesperus' and 'Phosphorus'. But, we can imagine our world prior to the discovery that Hesperus is Phosphorus. This could be known by people even if there were no names for Venus. They could point to it and say that it is self-identical. So, since people already knew that Venus is self-identical (prior to the discovery that Hesperus is Phosphorus), that is not what they discovered when they discovered that Hesperus is Phosphorus. If it were, then they would be discovering what they already knew to be true.

This example demonstrates that it is a mistake to think that this sort of empirical discovery is the discovery of necessary truth, and shows that sentence „Hesperus is Phosphorus“ is ambiguous. The argument is the following: prior to the discovery it is obvious that people know that Hesperus is Phosphorus, because they knew the necessary truth that Venus is self-identical. But, since they haven't yet made the discovery, it is obvious that they didn't know that Hesperus is Phosphorus. So, the conclusion is that there must be two facts here: one that is known prior to the discovery, and the other that is known when the discovery is made. The second fact is metalinguistic, and this claim comes from what is learned when the empirical discovery is made. It follows that people learned that Hesperus and Phosphorus are the same object, and this does not mean that they learned that the object was self-identical, because they already knew that. They learned that the object named 'Hesperus' is the same as object named 'Phosphorus', or that Hesperus had the property of being named 'Phosphorus', or *vice versa*. So, this is a contingent fact, since the planet need not have been given the names it was given – nor even named at all.

Kripke's account is *causal theory of names*. If causal theory is used to explain the different cognitive content of 'Hesperus is Hesperus' and 'Hesperus is Phosphorus', the reference to names 'Hesperus' and 'Phosphorus' is essential since names play a crucial role in the cognitive content of „Hesperus is Phosphorus“. If this is ignored and if names 'Hesperus' and 'Phosphorus' are considered as *unquoted* words in the sentence then they both simply represent one thing – the planet Venus. In this case, there is no way to explain the different cognitive content of 'Hesperus is Hesperus' and 'Hesperus is Phosphorus'. Kripke rejects the view that Hesperus might not have been Phosphorus, holding that if Hesperus and Phosphorus are identical then they are necessarily identical. The above argument does not deny this, it denies that this is what is learned when it is learned that Hesperus is Phosphorus, and what is learned is that the object named 'Phosphorus' is the same object as the one named 'Hesperus'.

Discovery was not about the necessary fact that the planet is self-identical, but about the fact that the same planet had these two names.

b. Kripke's argument regarding the identity of natural kinds

Here Kripke argues that expressions 'gold' and 'element with atomic number 79' both are rigid designators, and since they both designate the same referent, the sentence (G) „Gold is the element with atomic number 79“ is *necessary truth*. That is another way of saying that gold is necessarily the element with atomic number 79, or that atomic number 79 is the essence of gold. He points out that it was an empirical discovery that gold had such an atomic number, concluding that necessary truth about gold was learned *a posteriori*. It has to be admitted that gold has an essence and that (if atomic theory is correct) atomic number 79 is the essence of gold. Of course, it was an empirical discovery that gold has atomic number 79. But, it may be argued that these two are different facts and that empirical discovery was not of the necessary truth that atomic number 79 is the essence of gold. The main argument is that there is difference between: a. sentence (G) and b. necessarily (G). It is necessarily (G) which is the significant discovery, and it was traditionally been thought to be impossible *a posteriori*. It is necessary to explain how scientific identifications are made and Kripke says that the discovery of essence is made empirically, without explaining how it is done. The explanation could be that someone names some particular metal 'gold'. So, what has been empirically discovered is that gold has 79 protons. If atomic theory gives the right analysis about the essence of elements, than having 79 protons is the essence of gold, and it could be said that necessary truth has been discovered *a posteriori*. We need criterion by which it is possible to determine what properties give the essence. It is not discovered empirically that the atomic theory gives the essence of elements. By empirical means we have learned only a truth that happens to be necessary.

In general, both Kripke's arguments (argument that there are contingent *a priori* truths, and argument that there are necessary *a posteriori* truths) about named and essentially described entities are doubtful since they are ambiguities in each of the cases: first, what is known *a priori* is not what is contingent, and second what is necessary (essential) is not what is known *a posteriori*. Both arguments are doubtful from parallel reasons, by challenging the traditional connection between *a priori* and necessary truths, and between *a posteriori* and contingent truths, which demonstrate that Kripke's critic of classic three-fold distinction represent the view opposite to that of Carnap.

2.2. Carnap and Kripke about the Theory of the Name Relation

2.2.1. Carnap's Solution to the Antinomy of the Name Relation

Within the context of **method of the name relation** Carnap points that logical antinomies/paradoxes are characterized by the fact that there are two main methods of reasoning. Although both of them are plausible, they lead to the contradictory conclusions. Solution of this antinomy consists in changing the reasoning procedure. He points out that the assumptions must be abolished and restricted in such way that it is no longer possible to derive the incompatible conclusions. So, solution is that certain form of inference has to be restricted, and that sentences (previously regarded as meaningful and harmless) have to be refuted. But, different ways of solution are possible, and it is a matter of theoretical investigation to discover the consequences of each solution. The question which solution to choose in order to construct a language system is practical decision. Carnap explains six solutions of the antinomy of the name-relation calling them as methods I-VI (the first five preserve the method of the name-relation as adequate solution, at least to some extent). In accordance to his analysis of the antinomy of the name-relation, he presupposes that each of the solution suffers from serious disadvantages, and his intention is to solve the antinomy by giving up the method of the name-relation, and in that purpose he maintains that *the method of extension and intension* is suitable method for semantical analysis.

Method I, proposed by Frege. Carnap points out that Frege's method consists in regarding an expression as a *name* for concrete or abstract entity, characterized by using the *name-relation* as its basic concept. The name-relation holds between expression in language and concrete or abstract entity/object of which that expression is a name. In Carnapian terminology this relation is *semantical relation*, and various phrases have been proposed for expressing this relation: „*x* is a name for *y*“, „*x* denotes *y*“, „*x* designates *y*“, „*x* signifies *y*“, and „*x* names *y*“. Special feature of this semantical relation is that semantical role of name may be regarded as referential, but that reference does not exhaust name's semantic function. This thesis leads Frege to his famous distinction between *sense* and *reference/meaning*, and on this ground he emphasizes that (proper) name expresses its sense, and means or designates its meaning.

Three main principles of the method of the name relation are the *principle of univocality*, the *principle of subject matter* and the *principle of interchangeability* (in both forms), and the accent was on third principle. Concerning this principle, according to Carnap, it seems that Frege was aware of the fact that the principle of interchangeability leads to contradiction,

if the ordinary *nominata* of names are also ascribed to their *oblique occurrences*, which presents his solution of the antinomy. But, he does not speak explicitly of the necessity of avoiding the contradiction, and gives other reasons for distinction between *ordinary* and *oblique nominatum of the name*. This distinction has to be taken as not contradictory.

As far as the *disadvantages of Frege's method* are concerned, Carnap points out that there is the *unnecessary multiplicity of entities and names*, which is generally consequence of the method of the name-relation. Further problematic point of Frege's method is that the *occurrences of the same name may have different nominata*, and actually an infinite number of them, and in certain contexts even the *same occurrence of name may have simultaneously several nominata*. However, Carnap still regards that it is possible to see this method as one solving the antinomy.

Method II, proposed by Quine. Quine uses the terms '*designates*' and '*designatum*' in the sense of the customary terms 'names' and 'nominatum'. The principle of interchangeability, in its second form, he calls the *principle of substitutivity*, according to which if true identity statement is given, then one of its two terms may be substituted for the other, in any true statement, and result will be true. Carnap points out that this principle is not meant as a rule for an identity sign, it is rather explicit formulation of procedure customarily applied in the ordinary word language (based on customary interpretation of words). Quine also distinguishes *designatum of an expression* and *its meaning*, which in some respects may be regarded as similar to Frege's distinction.

Carnap reminds that for Quine the occurrence of expression in *nonextensional* (oblique) *context* (like 'the evening star') is *not purely designative*, and it does not refer to the *nominatum* (designated object). For Quine nonextensional contexts are fundamentally different from extensional contexts, and more similar to 'not purely designative'. Customary logical rules of specification and existential generalization are not valid for nonextensional contexts, which is clear in the context of modal logic. In this respect, his solution agrees with that of Frege in one point: in ascribing no ordinary *nominatum* to the occurrence of the name in nonextensional context. Quine ascribes no *nominatum* at all. Consequently, the principle of interchangeability/substitutivity is not applicable to these occurrences, and in this manner the antinomy may be eliminated.

According to Carnap, the advantage of this method is in avoiding the multiplication of entities and corresponding names (to which Frege's method leads). Quine is forced to restrict the name relation (in his terminology, relation of designation) only to extensional contexts, by

imposing restrictions upon the use of variables in modal sentences, and regarded all non-extensional contexts as not purely designative. In Carnap's view, this fact could be decisive for logicians interested in semantically analyzed systems of modal logic (in the sense to not adopt this method).

Characteristic feature of Quine's view is that he is inclined to the *verification theory of meaning* (the meaning of statement is the method of its empirical confirmation. This theory states that statements are synonymous iff they are alike in point of method of empirical confirmation. Quine's account is account of cognitive synonymy of statement and not linguistic forms in general (namely, from the concept of synonymy of statements it is possible to derive the concept of synonymy for other linguistic forms).

Method III, proposed by Church. Carnap regarded Church's view of Frege's method. Church defense the distinction between nominatum and sense, developing further details of its application. He regards class as the ordinary nominatum of predicator of degree one, and common noun and property as its ordinary sense, which shows that he is in accord with Frege, and finds his method more preferable (than that of Quine) because it provides that *name always has a nominatum*, even in nonextensional contexts, and his conception of sense of names seems more natural than Quine's way of construing the sense (or meaning of name) as its L-equivalence class.

But, Church didn't adopt the original form of Frege's method, proposing some important modifications. He is in agreement with Frege's thesis that the nominatum of an *oblique occurrence of name must be different from its ordinary nominatum and must be the same as its ordinary sense*, but only as the result of the analysis of nonextensional sentences, occurring in natural word languages and modal logic. This means that in well-constructed language Frege's multiplicity of nominata for the same name should be avoided, and Church proposes that it would be useful to *adopt some notational device for distinguishing the oblique use of name from its ordinary use*.

Carnap agrees that changes proposed by Church represent important improvement, but they imply additional complication in modal logic: there would be an infinite number of types corresponding to the one type of sentences in the method of extension and intension. Despite the fact that this method avoids the multiplicity of nominata for the same name it has other complications. In fact, Carnap is inclined to regard Church's form as one which carries out the fundamental ideas of the method in the most consistent way, by eliminating not tolerable features from the well-constructed language.

Method IV, proposed by Russell. According to Carnap, Russell was the first who recognized paradoxical character of Frege's method, regarded the name-relation as the theory of denoting. Russell was interested in the second form of the antinomy, explaining it with respect to the interchangeability of individual expressions. The principle of interchangeability may be formulated as „if a is identical with b, whatever is true of one is true of other, and either may be substituted for other in any proposition, without altering the truth of proposition“. Analogously, he constructed the *antinomy of the name-relation with respect to individual expressions*, and description ('the author of Waverley') is replaced by the proper name ('Scott'). Description has no meaning in itself, but the sentence containing description has the meaning, and it can be expressed without using the description. *Contextual definition of description*²² is taken as the rule for transforming the sentence containing the description into sentence with the same meaning, which no longer contains the description. In the case of individual description that fulfills the uniqueness condition, individual/descriptum may be regarded as nominatum of description, but sentence containing this description is not about that individual. This means that the *principle of subject matter is rejected with respect to descriptions*. Russell points out that meaning of sentence may be shown only in its expanded form. Proper names are regarded as abbreviations of descriptions. But, since in the primitive notation neither proper names nor descriptions occur, *the principle of interchangeability for individual expressions is not applicable*. Therefore, antinomy of interchange of individual expressions is eliminated. Russell concludes that *the principle of interchangeability with respect to class expressions is not applicable*, and the antinomy does not appear.

Carnap points that Russell regards sentences as *names of propositions* and not as names of truth-value (assuming that he regards them as names at all). Final results Carnap summed up in few main theses:

- (i) individual expressions and class expressions may be regarded as naming individuals or classes,
- (ii) individual expressions and class expressions do not occur in the primitive notation, they are incomplete symbols without independent meaning,
- (iii) neither individuals, nor classes, nor truth-value, (extensions) occur as nominata in the strict sense,
- (iv) the antinomy of the name-relation arises from interchange of two expressions with the same nominatum,

²² Russell's theory of descriptions is designed to solve puzzles regarding apparently referring expressions. Also, see the chapter concerning the method of extension and intension, especially part dedicated to method proposed by Russell.

- (v) in all kinds of instances of the antinomy, the common nominatum is an extension,
- (vi) the exclusion of the extensions from the realm of nominata eliminates the most important instances of the antinomy.

Carnap presents Russell's objections regarding Frege's method, and the most important concerns the description, which does not fulfill the uniqueness condition. For Frege description has sense but not nominatum, while Russell rejects that expressions of the same syntactical form in one case have nominatum and in other case not. Russell is uneasy about the introduction of senses, and he thought that their nature is problematic, posing serious ontological and epistemological problems. He insists on distinction between names and (definite) descriptions: *name* is symbol whose meaning is something that can only occur as subject (name directly designates individual which is its meaning, and has this meaning independently of meanings of other words), while *description* consists of several words, whose meaning are already fixed.²³ Russell rejects Frege's introduction of *Sinn*, sticking to pure referential theory of meaning.

Carnap points that some disadvantages occurring in Russell's method lie in the fact that meaning is denied to individual and class expressions. The fact that these expressions can be introduced by contextual definitions (and that all what is said by their help can be said without them) is not sufficient justification for excluding these expressions from semantical meaning analysis. According to him these expressions do not possess independent meaning. Despite the fact that these two views are different, because of the similar way of handling the puzzles about proper names, they are often assimilated. As far as proper names are concerned, both are described as „descriptivist.“ But, Carnap points that their views are fundamentally different, calling Frege's view *sense descriptivism* and Russell's *abbreviation descriptivism*. Their conception of presentation is different: for Russell, any object that can be presented at all cannot be presented in different ways, and for Frege the modes of presentation are the constituents of thoughts, while objects presented by modes of presentation are not. The difference between Frege's two-tiered and Russell's one-tiered semantics is reflected in their different epistemological views on presentation.

²³ When descriptions occur in proposition it is necessary to make distinction on primary and secondary occurrence. For example, if we consider the proposition „The present King of France is bald“, here „the present King of France“ has a primary occurrence, and the proposition is false. On the other hand, if we consider proposition „The present King of France is not bald“ we have an ambiguous situation. If we first take 'x is bald', and then substitute „the present King of France“ for 'x' and then deny the result, the occurrence of „the present King of France“ is secondary, and the proposition is true. But, if we are to take 'x is not bald' and substitute „the present King of France“ for 'x' then „the present King of France“ has a primary occurrence and the proposition is false.

Method V, Extensional Language. According to Carnap, the most radical method of elimination of any antinomy arises in connection with excluding these forms entirely. In the case of the antinomy of the name-relation this solution would consist in excluding all nonextensional contexts, or in using purely extensional language. Carnap explains that in order to eliminate the antinomy by excluding all nonextensional contexts, it would be necessary to show that extensional language system can be constructed. This means that for any nonextensional system there is an extensional system, into which the former can be translated. The question whether it is possible is still open to debate. Despite to this open question, translatability into extensional sentences has been shown for certain kinds of nonextensional sentences (Carnap explains this by example that *modal sentence* is *L-equivalent* to *semantical sentence*). But, the application of translation involves some difficulties, like translation of *sentences with iterated modalities*, or translation of *nonextensional sentences with psychological terms* like 'believes', 'knows', etc.

So, the main point here is that if it is possible to prove the thesis of extensionality, and if we exclude all nonextensional sentence forms, the antinomy of the name-relation would be eliminated. In this case the difference between the method of the name-relation and the method of extension and intension would disappear, since – with respect to extensional occurrences – the nominatum of expression is the same as its extension and the sense is the same as its intension. But, despite the fact that the thesis of extensionality can be proved this is not sufficient justification. What remains to be done is to demonstrate that extensional language for logic and science is not only possible, but more efficient than nonextensional forms of language. At the one hand, extensional sentences follow simpler rules of deduction than nonextensional once, and on the other hand, nonextensional language supplies simpler forms of expression. In short, both forms of language have their advantages, but before any final decision, the more complex and deeper investigation of nonextensional and modal language systems will have to be done (this is the main reason why Carnap lefts aside this method as solution of the antinomy).

Method VI, Extension and Intension. The main point is that instead of the method of the name-relation, the *method of extension and intension* is used for semantical analysis. The concept of *nominatum does not occur*, and in this case the antinomy of the name-relation in its original form cannot arise. But, the concept of extension coincides with the concept of nominatum in many respects, and we can recognize that the antinomy of the identity of extension is analogous to that of the identity of nominatum. In Carnap's view, the antinomy in

question would arise if for the concept of extension, the principle analogous to the principle of interchangeability of names was lay down. But, he points that form of the method of extension and intension excludes the antinomy. First, this *excluding* means prescribing the principle of interchangeability, which is restricted to extensional contexts (expressions with same extension, or equivalent expressions). On the other hand, second principle of interchangeability concerns L-equivalent expressions, or those with the same intension, which is related to Frege's second principle.

The interesting question is why, if restriction of interchangeability to extensional contexts assures the elimination of the antinomy, we might not keep Frege's two concepts and restrict his first principle to extensional/nonoblique contexts. Carnap put the accent to one very important thing: Frege's concept 'bezeichnen' is meant in the sense of the name-relation, relation characterized by the principle of univocality and the principle of subject matter. If we use a concept for which this principle does not hold unrestrictedly, then that concept is not the name-relation. The method of extension and intension in fact avoids all those features from which all other methods suffer.

From his analysis of all proposed methods, Carnap draws – *from the point of view of the method of extension and intension* – the following main conclusions:

- (i) there is ambiguity in the concept of nominatum, e.g. even if we understand clearly what is meant by given predicator, we may regard either the property or the class as its nominatum,
- (ii) the concept of extension does not involve any analogous ambiguity,
- (iii) the complications come from the fact that different occurrences of the same expression may have different nominata,
- (iv) since extension of expression is always the same, and independent of the context, no analogous complications are caused by the method of extension and intension,
- (v) on the contrary to the restriction of the name-relation to extensional context, there is no analogous restriction of application of the concept of extension in the method of extension and intension,
- (vi) despite the efforts to avoid some serious advantages of Frege's method, Church's method still shares the most of them, and his modifications of Frege's method causes new complications, which do not occur in the method of extension and intension,
- (vii) the main disadvantage of Russell's method lies in its denial of meaning to individual expressions and class expressions, while in the method of extension

and intension there is no such restriction, and extension and intension are ascribed to every expression of these kinds.

So, the method of the name-relation appears in various forms with different authors. Carnap finds that most of the authors are not aware of the antinomy, and do not develop the method in sufficiently explicit form (which enable us to see whether and how they avoid the contradiction). So, it is not surprising that all proposed procedures for the elimination of the antinomy suffer from very serious advantages. Some procedures lead to great complications and others to certain restriction of application of semantical meaning analysis. All these remarks do not go in favor to the method of the name-relation and, as Carnap asserts, it seems doubtful whether this method is quite suitable method for semantical analysis.

2.2.2. Kripke: Naming, Reference, and Sense

Kripke is concerned with the connection between *present use of name* and *referent*, and in that purpose he introduces the notion of „*historical chains of communication*“. He explain this notion by his famous example of 'baptism'. This thesis emerges historical chain of uses of the name, bridges up the gap between the *present use of name* and the *individual so named*. „*Historical chains of communication*“ is also known as „*causal chain of communication*“, and the main idea is that one's use of the name can be thought of as causal factor, in listener's ability to use the name to refer to the same individual.

Kripke appeals to two types of arguments, those having to do with *what might have been the case* and those having to do with the *rigidity of designation*. By name he understands a **proper name** (name of person, city, etc). The notion of 'definite descriptions' he uses in negative sense, and consequently **name does not include** definite descriptions. Name includes only those things which in ordinary language are called 'proper names'. A common term for names and descriptions is '*designator*'. According to Kripke it is less misleading to use technical term *denote* rather than *refer*, since the speaker may refer to something other than the referent of name.

The *referent of name, or description*, in Kripke's sense may be called the **semantic referent**, for name this is the thing named, and for description the thing that uniquely satisfy the description. But, the **speaker reference** is more difficult notion, and generally the *speaker referent of designator* is the object about which speaker wants to talk about (on a given occasion). Speaker uses the designator with intention of making the assertion about the object (which may not be the semantic referent), and speaker's referent is the thing that speaker referred to, by the designator. Kripke reminds that semantic referent of the designator is given

by *general* intention of speaker to refer to certain object whenever the designator is used. On the other hand, speaker's referent is given by *specific* intention, on given occasion to refer to certain object. The *speaker referent versus semantic referent* is contrast that he invokes in the argumentation against the semantic significance of the *referential-attributive distinction*. In short, if description is used referentially, the speaker's referent may be distinct from the semantic referent, while in attributive use they cannot be distinct. But, Kripke's distinction may seem misleading because definite descriptions, being quantificational phrases, do not have semantic referents.

He also regards the important relation between the *implicature* of the utterance and the meaning of that utterance, and undertakes the analysis of what conditions must be satisfied if we want correctly say that utterance has meaning, or what must occur in order that the particular utterance is to be judged as meaningful.

His distinction on *rigid* and *nonrigid designators* means that some designators designate object *rigidly* (in all possible worlds) and *non-rigidly* (not in all possible worlds). Possible worlds are just counterfactual situations or possible ways that actual world might have been. Rigid designator has the same reference in all possible worlds, but this does not imply that object designated exists in all possible worlds, it implies that name refers rigidly to it. Nonrigid or accidental designator can refer to different objects in different counterfactual cases. In the case of essential property of object, rigid designator of the necessary existent is *strongly rigid*. But, this distinction is not co-referential with distinction on proper names and descriptions, since *ordinary names are rigid designators*, while *most descriptions are nonrigid*. This is the main thesis of his argument against the equivalence of proper names with definite descriptions: they are not equivalent since they designate in different ways. View that names are introduced by description may be taken either as the *theory of the meaning of names* or the *theory of their reference*. Kripke allows that it is possible to use certain description *to fix the reference of term*, but once it's done the *name is not synonymous with the description* (it does not stand for whatever fits the description). Concluding that names are not synonymous with definite descriptions Kripke establishes the distinction between two kinds of definitions: the definitions that fix a reference and those that give a synonym. This distinction holds for names as well, but if reference of name is given *by description/cluster of descriptions* name is not rigid designator (name will not necessarily designate the same object in all possible worlds). But in some cases the reference of name could be fixed by description which implies that names are not always rigid designators. On the other hand, Kripke denies that the meaning of name is synonymous with description and that descriptions determine the

reference of name. In some cases description can fix the reference of name, but the crucial point is that name stands for actual person/thing (even in counterfactual cases in which it does not satisfy the description). So, there are two kinds of definite descriptions: *non-rigid* and *rigid definite description*. Both kinds of definite descriptions can be introduced in formal language by special notation. Definite descriptions are *ambiguous*, and distinction between non-rigid and rigid definite descriptions is the source of *de dicto* – *de re* distinction. Kripke's view that proper names are *always rigid* allows that it would be logically possible to have single words that abbreviate non-rigid definite descriptions, but in that case these *would not be names*. For him, such abbreviated non-rigid definite descriptions differ in semantical feature from proper names. More importantly, *rigid definite description* still determines its referent *by* its unique satisfaction of the associated property, and this separates it from *referential description* (Gödel-example). Conclusion is that the relation of description to what it denotes is *fundamentally different* from the relation of name to what it refers to. This is suggested by the fact that we speak of individuals satisfying descriptions, but not of them satisfying names. By 'semantic reference' of definite description Kripke means on its denotation, and he distinguishes reference from denotation. These are two different species of *designation*. Once we accept this distinction, it follows that all referring expressions are rigid designators, and all denoting expressions are non-rigid designators (except those that are rigid *de facto*, like 'the smallest prime').

So, what Kripke has established about the difference between proper names and definite descriptions? He established that proper names always designate rigidly while descriptions sometimes designate rigidly. But, what about the view that the sentences employing proper names are equivalent to sentences employing definite descriptions (or clusters of such descriptions)? *Kripke's view* allows distinctions between types of designation and special status of proper names. *The classical theorist view* explains the way in which names are connected to objects, they name the object that (in this world) satisfies certain description, and continues to name it even when we use the name to talk about different possible worlds. So, Kripke's basic conclusions are:

- the reference of name is not determined by uniquely identifying marks or properties satisfied by the referent,
- when referent is determined by description/uniquely identifying property, that property is not a synonym for name, it fixes the reference,
- identity should be taken as relation between a thing and itself, and identity statement between names is necessarily true, even though we may not know it *a priori*

(the basic problems come from confusion between what can be known *a priori* and what is necessary); identity statements, if true, must be necessarily true, and one does know *a priori* (by logical analysis) that if an identity statement is true it is necessarily true.

In his analysis of *the cluster concept theory of names* Kripke reminds on *strong* and *weak* version of this theory, depending whether it is taken as theory of meaning or theory of reference. The main issue in his analysis was the question how cluster concept theory handles the problem of the existence statements and the identity statements. Kripke rejects that the cluster description theory is reasonable and justified, as well as thesis that proper names are not words and do not have the meaning at all (e.g. P. Ziff's view). His objection to the description theories in general is based on his *modal argument* (his thesis that names are rigid designators). He argued that description theories are circular and his *circularity objection* is that it is necessary to make distinction between the *property of bearing the name* and the *property of being referred to by the name*. Kripke insists that bearing a name and being referred to by the name are *distinct properties*. According to him, description theories are challenged by three arguments: the unwanted necessity argument, the rigidity argument and the argument from ignorance and error. He has presented three objections to the description theories (of meaning and reference-fixing), namely *modal*, *epistemic*, and *semantic* objections. *Modal objections* are primarily against the thesis that there is some property that is authoritatively and automatically associated with the name, which is in accordance to the description theory. As we know, according to description theory, if two sentences are synonymous then they express the same proposition, and it is a *logical truth*, that proposition is *knowable a priori*, without any appeal to empirical evidence. *Epistemic objections* are directed, on one hand, to the claim that proper names are synonymous with definite descriptions, and on other hand, to the question whether something which is *logically true*, or *true by definition*, is knowable *a priori*. In this context it is important to pay attention to Kripke's *priority claim*, on which ground he concludes that description theories of reference-fixing are incorrect. *Semantic objections* are also known as argument from ignorance and error, and they challenge the thesis that the users of name associate with it description that identifies its bearer. All three objections lead to the conclusion that description theories (both of meaning and of reference-fixing) *incorrectly entail* that name fails to refer, or that name refers to an object that is not the real referent of the name.

In general, three questions lie at the center of philosophical controversy over proper names: do proper names have a sense, if yes, does the sense fix the reference, and are the name-to-name identity claims about words or their referent/s? These questions lead to considerable dispute, and the reason is that each is ambiguous. The issues concern the given interpretation of 'have', 'fix' and 'about'. On each question Carnap and Kripke offer different answers.

Carnap regards three basic principles of the name relation, influenced by Frege's theory. He points out that according to the *principle of univocality* every expression used as a name is a name of exactly one entity, or *nominatum* of expression. So, naming is function that assigns exactly one entity/*nominatum* to every expression of appropriate kind/*name*. The *principle of subject matter* deals with *nominata of names* occurring in it, the *nominata* of the names in the sentence constitute the *subject matter of the sentence*. The *principle of interchangeability/substitutivity*) holds that: a) if two expressions name the same entity, then true sentence remains the true when one expression is replaced in it by other, and b) if an identity sentence is true, then the two argument expressions are interchangeable everywhere (identity sentence is true iff both argument expressions name the same entity). Carnap defines the univocality of name in the sense of *nonambiguity*, and the ordinary ambiguities are eliminated in two ways: first, by assigning only one of its usual meanings to an ambiguous word, and second, by replacing it with several terms for several meanings. The *principle of subject matter* makes the third principle plausible, since if we accept the first two principles, we can hardly reject the third. Regarding the *principle of interchangeability* Carnap notices that its second form involves the name-relation implicitly in the concept of *identity sign* or *identity sentence*. The interchangeability of synonymous expressions (those which name the same entity) follows from semantical and syntactical rules of concept of equivalence.

The specific feature of Carnap's analysis is that he regarded these principles by an analogy concerning the *extension*. The analogue of the *principle of univocality* holds and *every designator has exactly one extension*. The analogue of the *principle of subject matter* holds with restrictions: *sentence containing a designator* may be interpreted as speaking about *extension and intension of that designator*. The same does not hold for the *principle of interchangeability*: for extensions, only the first principle of interchangeability holds, in its restricted form: if two expressions have the same extension, or if they are equivalent, they are interchangeable in extensional contexts. On the contrary to this, the *form b* speaks about identity. But, on the basis of the method of extension and intension, we cannot simply speak

of identity, and we have seen that Carnap makes *distinction between identity of extension and identity of intension* (equivalence and L-equivalence), disposing with two principles: one for equivalence and the other for L-equivalence.

But, the theory of names employing these three principles is not adequate for Carnap. According to him, if we apply the *principle of univocality* then in order to speak about two different entities, we have to use two different expressions as their names. On the other hand, if we apply the *method of extension and intension*, the situation is different: in that case a designator is regarded as having a close semantical relation to its extension and its intension. So, sentences containing the designator may be construed as being about both entities. Carnap emphasizes that in order to speak first about intension and then about corresponding extension his *method of extension and intension requires only one expression*, while *method of the name-relation* requires two expressions and leads to unnecessary duplication in symbolism. This view constitutes Carnap's thesis that it is possible to construct the language that instead of two types has only one type of expressions. But, since the choice of semantical method and the form of language are interconnected, the preference of language structure may influence the preference for one of these two semantical methods. Carnap points that if we take the language with one kind of predicator is effective as much as language with two kinds, more simply and more convenient, then the method of the name-relation must be regarded as misleading or inadequate.

So, both the *nominatum-sense* pair and *extension-intension* pair serve for semantical meaning analysis and represent two *components of meaning*. *Sense* and *intension* refer to the *meaning in a strict sense* (when we understand expression without knowing the facts), while *nominatum* and *extension* refer to the *application of expression* (depending upon the facts). The important difference consists in the fact that extension and intension, unlike nominatum and sense, are *independent of the context*. In Carnap's words, an expression in a well-constructed language always has the same extension and the same intension. In Frege's words, an expression in some contexts has its ordinary nominatum and its ordinary sense, and in other contexts its oblique nominatum and its oblique sense. So, analysis goes in two steps. First step is to compare the extension of expression with its ordinary nominatum, and Carnap's conclusion is that for any expression its ordinary nominatum is the same as its extension. The second step is to compare intension of expression with its ordinary sense, and Carnap takes that for any expression its ordinary sense is the same as its intension. Carnap's two concepts coincide with nominatum and sense but the difference arises with respect to the *oblique context*. Carnap's concepts lead to same entities while other two concepts lead to

different entities. Distinction between nominatum and sense is direct consequence of distinction on correlated concepts: *extension or denotation* and *intension or connotation* (comprehension, meaning). The general aim is to construct the pair of concepts sufficient and suitable as instrument for semantical analysis, and Carnap tried to achieve this aim by his extension and intension. The *name-relation* between expression and concrete/abstract object, of which that expression is a name, for Carnap is *semantical relation*, and points that the method of the name relation is important with respect to the question whether metalanguage (or any other language) can possibly be genuinely neutral.

A negative answer on question whether *proper names have a sense* leads to trouble to explain how name-to-name identity claims („Hesperus is Phosphorus“) can have real cognitive and empirical content. If names have reference and no sense, then identity claims that equate them should be analytic, without any cognitive content. But, they are not analytic, they often have cognitive, even empirical content, and so names must have sense. An affirmative answer to this question presupposes the account of what this sense consists in. The problem with this view, as Kripke points, is that statement predicating of named thing a feature mentioned in *its defining description*, would be analytic. For example, if 'being the highest mountain in the world' is Everest's defining feature, then the claim that Everest is that – would be an analytic truth. But, being the highest mountain in the world is a relational, contingent property, or contingent and empirical fact. So, it follows that name cannot be just a shorthand for description. Another account of the sense of name is that of a cluster of descriptions, where Kripke argues that this account does not remove the difficulty: it makes no difference whether the predicate identifies one identifying property, or one amongst many.

So, what is the question? If this question (*Do proper names have a sense?*) asks whether proper names are used to describe the features of objects, the answer is **no**. But if it asks whether proper names are logically connected with the features of object to which they refer, the answer is **yes**. The term 'have' in the above question seems ambiguous. On a strong reading, the question is *whether names possess a sense*, or whether an *internal relation* obtains between name and certain descriptions of object it designates. In fact, it asks whether such descriptions belong to the (meaning of the) name. On further reading of 'have', name need to be contingently related, or merely associated, with description. This means that name has a sense if it connotes, and this reading makes it difficult to deny that names have sense. To avoid confusion, it can be said that name *can carry (need not possess) a sense* but the question whether names do in fact possess sense still remains.

The fact that descriptions are useful and often necessary to learn how to use a name gives credence to view that sense determines the reference. Without description to pick out the thing to be named, the question is how the learner can identify what name names. In the case when learner is not acquainted with object it seems that description is indispensable. So, if proper name does not specify the features of the object referred to, how then it brings the reference off? The idea that a single characteristic pick out a name's reference runs into difficulty: usually, without contradiction, we can discover that given object did not have the supposedly definitive characteristic (we might discover that Everest is not the tallest mountain in the world). One way to deal with this problem is what Kripke calls „cluster theory“ of naming, where the key idea is that indeterminate class of descriptions pick out the object, or that sense determines the reference. This account explains how the reference of name remains unchanged in what we know about it (e.g. the reference of the name 'Aristotle' is not fixed by one description alone, but by set of overlapping descriptions: reference is determined indefinitely by *cluster of descriptions* – Searle's thesis). Kripke criticize that it is a necessary fact that Aristotle has the *inclusive disjunction* of properties commonly attributed to him – so that any individual not having at least some of these properties could not be Aristotle. He denies that this is necessary, claiming that it is *a contingent fact* that Aristotle ever did any of the things commonly attributed to him. The basis for this view is his '*proper names designate rigidly*' – thesis. The upshot of this asymmetry between names and descriptions is that sense does not determine the reference. Although the set of descriptions seldom picks out a unique object (or wrong object or fails to pick out an object at all) Kripke argues that though all of these ways of determining reference may fail, the name would still refer to its object. His alternative account of how reference is fixed is *casual*, having in its center the 'initial baptism'-thesis. Clearly Kripke has radically reconceived what it is to fix a reference, and *he denies that sense is what fixes the reference*. Is he right?

It seems that the issue turns on what the question *what fixes the reference?* is asking for. The question seems ambiguous. Does it ask for account about the origin of the name – where *fixing the reference* is understood in causal-historical terms? Or does it request account about how reference is initially, and thereafter, anchored in any given agent's linguistic competence? We know that initial baptism often requires descriptions to individuate the object to be named. Does this mean that sense determines the reference? If we accept that description helps to potential user of name to identify its object, it can look that way. Can description be taken as part of the name's sense when the name relation has not yet been set up? And how about each new link in the chain – shouldn't the reference need to be fixed for

each new user? Again, doesn't all this mean that sense determines the reference? It is quite clear that descriptions play important role in learning the names. Kripke's denial that sense determines the reference is intended to point to something else: to fact that a learned name frees itself from the descriptions that initially anchored it. His example shows that while we may have learned the name 'Moses' by means of description 'the man that parted the Red Sea', we may ask whether in fact Moses did that. The only reason that such speculation is not self-contradictory is that the name 'Moses' *has freed itself from* the description that initially anchored it in our understanding. For Kripke, contingency of such claims is the evidence for his thesis that sense does not fix the reference (sense may help to determine the reference initially but not thereafter).

The important issue is what name-to-name identity claims are about. If we accept that such claims express relation between objects, then they are reduced to *analytic expressions of self-identity*. But how to explain the fact that identity claims sometimes constitute valuable extensions of knowledge? It is necessary to distinguish what statement refers *directly* from what it refers *indirectly*. We can understand a *name-to-name identity claim* in two different ways: we can see it *in context* or *in isolation* (as statement about thing to which name refers). The question whether name-to-name identity claims are about *words* or *their objects* is the question which attitude it is appropriate to adopt.

In general, the three important questions (*do proper names have a sense, does sense fix the reference, and question about the name-to-name identity claims*) lead to conclusion that *proper names do not possess a sense but carry one, that sense helps to fix the reference initially but need not thereafter, and that the name-to-name identity claims can convey information about words even they do not describe them*. The view that names don't have a sense is the result of viewing them from the *theoretical point of view*, aiming to distinguish what belongs to name in itself from what is attached to it only contingently. Having in mind Kripke's thesis that *names designate rigidly* it is obvious that his view fits under this theoretical standpoint. The opposing view (that names have a sense) is the *practical point of view*: what names are is what they do, and neither can be isolated from their sense. Having in mind Carnap's acceptance of *the principle of compositionality* we can see that his view fits under the practical standpoint. Conclusion that names carry but do not possess sense can be seen as attempt to mediate between theoretical and practical attitudes. It was based on distinction between what properly (internally, necessarily, really) belongs to name, and what is just attached to it (externally, contingently).

2.3. Carnap and Kripke about Belief Sentences

2.3.1. Carnap about Belief Sentences

Carnap regarded the concept of *context that is neither extensional nor intensional*, and finds that it is the case of the *sentences about belief*. Here, replacement of subsentence by an L-equivalent sentence changes the truth-value and intension of whole sentence. This kind of sentence has the usual form like „Petra believes that p “, containing the psychological terms. Carnap was interested in question how to analyze the sentence reporting belief, and whether they are about *proposition or sentence*, or something else. In the purpose of his analysis he has constructed the object language S which contains the predicator ‘..believes that..’, having its ordinary meaning, and the main semantical concepts ‘true’, ‘L-true’, ‘equivalent’ and ‘L-equivalent’ (used in accordance to established conventions and definitions). Analysis begins with belief-sentences like ‘Petra believes that D .’ and ‘Petra believes that D^* .’ The possible answers to the question whether Petra believes what these sentences say or not are *affirmative or negative*. The affirmative answer leads to her *belief* and negative to her *non-belief*. Carnap distinguishes two possibilities: one of professing belief and other professing neither belief nor non-belief. His result was that two belief-sentences have *different truth-values* and that they are neither equivalent nor L-equivalent. With respect to interchangeability and L-interchangeability Carnap points that occurrence of ‘ D ’ in first sentence is *not interchangeable* with ‘ D^* ’ in second sentence, it is *not L-interchangeable* with ‘ D^* ’. He shows that in the case of first belief-sentence the both conditions of extensionality and intensionality *are not fulfilled*, and concludes that *belief-sentence is neither extensional nor intensional* (with respect to its subsentence). Although ‘ D ’ and ‘ D^* ’ have the same intension (L-true or necessary proposition) and therefore the same extension (the same truth-value) their interchange transforms first belief-sentence into second belief-sentence which does not have the same extension as the first one.

The answer on the question whether belief sentence is about proposition or sentence, according to Carnap, is that belief-sentence is about sentence and about proposition. His point is that belief sentence must have a stronger relation to its subsentence and something more in common with it than intension. This means that two sentences must be understood in the same way, they must be L-equivalent and consist of L-equivalents parts in the same way: two sentences must have the same *intensional structure*. Thus, if *two sentences are built in the same way* out of designators, such that two corresponding designators are L-equivalent or have same intension, then they are *intensionally isomorphic* (have *same intensional structure*)

and this kind of relation Carnap calls *synonymous*. So, the special question is that of *analysis of intensional structure* of designators (especially sentences). Analysis is meant as *semantical analysis* by semantical rules, and Carnap's main purpose was to show how sentence is built out of designators, and what are their intensions. The special requirement for the isomorphism of two expressions consists in analysis of both expressions down to the smallest subdesignators. Also, metalanguage has to be introduced in purpose of comparative analysis of intensional structures of two expressions belonging to different language systems (in Carnap's case, *S* and *M*). The two sentences, belonging to two different language systems, are intensionally isomorphic iff the L-equivalence of the corresponding signs is established. But, this request was not enough and Carnap defines *intensional isomorphism* as relation between expressions that is stronger than the relation of L-equivalence. Of course, here he deals with different contexts: the crucial point is that intensional contexts and the contexts provided by belief sentences *are not the same* – the former admits the substitution of L-equivalent expressions while latter doesn't. We know that his method of extension and intension is *two-level semantical system* and it is obvious that it cannot treat the problem of belief sentences on the analogy of modal sentences. This is the reason why the concept of intensional isomorphism is used. But, the question is whether Carnap's solution based on the intensional isomorphism is adequate, since the problem of belief sentences is putt over into the object-language.

What is the main conclusion? Conclusion is that Carnap gives no semantical analysis of belief sentences, not in the sense in which he gives semantical analysis of intensional contexts. For intensional contexts he lays down the rules for the interchange of expressions, based on semantic relations between expressions and entities. Meaning analysis of designator within the intensional sentence shows how meaning of sentence is constituted. In the case of belief sentence such semantical analysis is not provided. Rather, the analysis translates belief sentences into other sentences to which *then* semantical analysis may be applied. The analogy between *the intensional context* and *the belief sentence context* raises the following question: if only full semantical analysis is appropriate to intensional contexts, on what grounds similar treatment is denied for the belief sentences? The answer is that Carnap's system admits just two varieties of entities: his system appeals to extensions and intensions. The assimilation of the belief sentences to the intensional contexts is not plausible to Carnap. His treatment of intensional contexts is directed to the interpretation of language in which modalities and quantification are intermixed. In short: his intensional entities depend on L-truth, L-truth depends on state-descriptions, and state-descriptions are constructed in purpose to give semantical analysis for languages combining modalities and quantification.

His next step was to compare the intensional isomorphism with synonymy in order to extend his interpretation of the belief sentences. This understands that the *exact translation of belief sentence* requires much more than agreement in the intensions of sentences (their L-equivalence). Even in the case of restricted meaning (designative or cognitive meaning) the L-equivalence of the sentences is not sufficient. Does Carnap use the *translation principle*? So, it is clear that belief sentences are neither extensional nor intensional, and they cannot be reduced to extensions or intensions. This implies that the principle of interchangeability with respect to extension and intension is not useful here. On the other hand, the translation principle states that if sentence of one language expresses the truth in that language, then any translation of it in any other language also expresses a truth. Further, since we know that the intensional contexts and contexts provided by belief sentences are not the same (former admits the substitution of L-equivalent expressions, while latter do not), the translation of belief sentences to the sentences of intensional context is not possible. But, what about the intensional isomorphism? If we accept, like Carnap, that the intensional isomorphism is what we need it follows that the translation could work between two sentences with same intensional structure. But, since problem of belief sentences is put over in object language we have to introduce the metalanguage for the analysis of two expressions that belong to different language systems: it is necessary to analyze the belief sentences not in the context of object language but in the context of metalanguage. What we need here is the translation of the sentences of object language to the sentences of metalanguage.

2.3.2. Kripke's Puzzle about Belief

In his famous example, Kripke concludes that Pierre has *contradictory beliefs*: that he believes that London is pretty *and* he believes that London is not pretty. Taken in this way, it follows that this puzzle also presents the *inconsistency of belief*. In general, puzzle has two versions:

- the *inconsistency version* – the sentences „Pierre believes that London is pretty“ and „Pierre believes that London is not pretty“ lead to inconsistency,
- the *contradiction version*: we may conclude that Pierre does not believe that London is pretty, on the basis of his behavior as an English speaker, but on the basis of his behavior as a French speaker, we must conclude that he does believe that London is pretty – and this leads to contradiction.

Kripke provides a several plausible principles, namely the *disquotational principle*, the *biconditional form of the disquotational principle*, and the *principle of translation*. These principles have the following forms:

- a. the *disquotational principle*: if a normal English speaker sincerely assents to p , then he believes that p (where p is to be replaced inside and outside all quotation marks by an appropriate standard English sentence);
- b. the *biconditional form of the disquotational principle*: a normal English speaker will be disposed to assent to p iff he believes that p (where any appropriate English sentence may replace p throughout);
- c. the *principle of translation*: if a sentence of one language expresses a truth in that language, then any translation of it into any other language also expresses a truth.

These three principles are necessary for Kripke's reasoning. He needs the *disquotational principle* in order to move to „Pierre believes that London is not pretty“ from Pierre's assent to „London is not pretty“, and from Pierre's assent to „Londres est jolie“ to „Pierre crois que Londres est jolie“. He needs the *principle of translation* to move from „Pierre crois que Londres est jolie“ to „Pierre believes that London is pretty“. So, in its inconsistency version Kripke's puzzle needs both *the disquotational* and the *translation* principles. In its contradiction version he needs the *biconditional form of the disquotational principle* in order to move from Pierre's non-assent to „London is pretty“ to the conclusion that Pierre does not believe that London is pretty. His puzzle can be treated by drawing distinction between *beliefs of certain believer* (these are constituents of his doxastic logic) and *belief-sentences*. Beliefs can be treated as linguistic (symbolic) representations, in order to be able to analyze the belief-sentences. In that case, such beliefs sentences do their *reporting job* not by displaying beliefs, but by describing them by the mechanism of adequate paraphrasing.

So, *belief of believer play a major role*, it can be taken as *linguistic representations*, and we can explain this by following example: let say that at given time t believer is in a certain belief-state, reflecting any beliefs he has at that time. Such belief-states are classifiable by particular beliefs that present a constituent of causal order. The acquisition of beliefs can be caused by various stimuli, and believer's possession of certain beliefs can cause modes and dispositions of behavior. Beliefs being linguistic representations (sentences) are in one language or another: e.g. believer may have „Londres est jolie“ but not „London is pretty“ as one of his beliefs. This could be attested by his disposition to assent to the first but not to the second belief in appropriate circumstances (e.g. when believer does not know English

language). If believer assents to both in appropriate circumstances, then they constitute *two distinct beliefs* of him.

This perspective should be contrasted with the theory which takes beliefs to be *propositions* where belief is taken to be linguistic representation in *particular language* (which is not context-independent). A multi-lingual believer possesses beliefs in more than one language which means that he may possess various distinct beliefs in different languages he speaks which convey the same message. In general, *verbal dispositions* (possibilities to assent or not to assent to certain sentences) are the key indicators of sentences' being beliefs. In other words, beliefs belong to the level of internal representations of believer and they reside *within his belief-world*. To specify *believer's beliefs* is to characterize his belief-world *purely internally*, or without having to assume the existence of any particular object outside the believer himself. Beliefs, being linguistic representations, can be classified in two ways:

1. as *de dicto* ascription it *reports that believer has a dictum* or proposition (or what a sentence says) as the object of an attitude/his belief,
2. as *de re* ascription it *relates believer to thing/res* (this is object-dependent belief).

De dicto-belief construction (in the form 'r believes that p') Kripke finds puzzling in ordinary language. To take beliefs as linguistic representations suggests that the *possession of different beliefs plays different causal roles in believer's interaction with the world*. When believer's assertions are expressed in another language such claim will not be plausible any more. It becomes clear that believer's assertion is an adequate paraphrase, which is a cornerstone of the indirect speech construction. It is often used within the boundaries of given language (common to the believer and the speaker), but it figures critically in adequate translation. The ordinary language belief statement 'r believes that p' depends upon the notion of adequate paraphrase. This means that Kripke's puzzle can be brought to light if we use the analysis of belief sentences which employ the notion of adequate paraphrase in a way that does not make this notion paradoxical.

2.4. Carnap and Kripke: The Main Questions and Particular Frameworks

As a last step of our comparative analysis is to list the questions they take to be the fundamental for the main issue here: meaning and modality. In order to define these main concepts Carnap and Kripke has different starting point, different particular framework. The titles of their capital works refer to the key concepts of meaning/naming and necessity. Both Carnap's pair of meaning and necessity and Kripke's pair of naming and necessity do not revile the necessary order or the priority of these concepts: it is not obvious what defines

what. However, one thing is more than obvious: both of them refer to the one and same modal concept – *necessity*. Having in mind our previous comprehensive analysis it is possible to find out the connection and the relationship between Carnap's meaning and Kripke's naming with respect to necessity.

Carnap's case. It has been shown that Carnap's system represents the study in semantics where his method of semantic analysis serves as a ground for further analysis of modality/necessity. His method of extension and intension is semantical method in question, but the introduction to this method has its root in Carnap's beginning ideas regarding the linguistic framework. His distinction on *internal and external questions* explains the concept of linguistic framework. The first kind of questions is about the existence of new kind entities within the linguistics framework and second about the existence of the system of entities as a whole. If we want to speak in our language about a new kind of entities we have to introduce a system of new ways of speaking, subjected to new rules as well, and this procedure is known as the construction of *linguistics framework* (for the new entities in question). Of what relevance the linguistic framework is for the internal questions? *Internal questions* and their answers are formulated by new forms of expressions, and found by logical or empirical methods, depending whether the framework is logical or factual. The concept of reality presented by internal questions is empirical, non-metaphysical concept. Once the thing-language is accepted (and thereby the framework of things) we can raise and answer internal questions. On the other hand, *external questions* are about the reality of the thing world itself, usually raised by philosophers (Carnap rejects that this kind of questions should be addressed to metaphysicians and points that to be real in scientific sense means to be the element of the framework).

Carnap is inclined to *linguistic internalism* meaning that we cannot speak from outside the language, but only from within the linguistic frameworks to whose rules we already conform. When the different frameworks are in play we speak about framework pluralism. Frameworks are *ontologically commitments*, meaning that the adoption of the framework involves ontological commitment to the entities over which quantifiers of the framework range. It is possible that *ontology is framework-dependent*, which is a corollary of the thesis of linguistic internalism, which means that we cannot speak from outside linguistic frameworks altogether, and hence there is no viewpoint for ontology other than that supplied by the frameworks to which we subscribe. But, to the extent that different frameworks are independent, and doing different jobs, their existential quantifiers also seem to be doing different jobs, and according to Carnap each framework seems to bring its own notion of reality and this repre-

sents the thesis of *ontological pluralism*. *Pragmatism* about the adoption of frameworks means that there are legitimate pragmatic issues which may be raised about the framework.

Interesting question here is whether Carnap's internal-external distinction hangs on *analytic-synthetic distinction*? It can be seen that here we have a certain kind of failure of the analytic-synthetic distinction, meaning that internal questions can be ultimately pragmatic but not sharply distinguished into analytic and synthetic groups. In other words, the commitment to framework is never absolute. The point is that *if there is no proper distinction between analytic and synthetic* then there is no base to contrast ontological (i.e. metaphysical statements that Carnap rejects) and empirical statements of existence. Carnap was primarily interested in various kinds of assertions of reality and unreality that contain various kinds of objects (even abstract entities), and his main aim was to analyze them with respect to the question of theoretical content, question of empirical sense and question of verifiability: he was interested in *logical analysis* of these kinds of assertions.

Having in mind his debate with Quine regarding the analytic-synthetic distinction, we can see that Carnap is inclined to this distinction and moreover to follow the usual classification of statements with respect to three main contexts of expressions: metaphysical, logical-semantic and epistemological context. Starting with logical-semantic context, he accepts that analytic statements are necessary and *a priori*, while synthetic are contingent and *aposteriori*. This viewpoint differ him from Kripke who questions this common classification by accepting the *necessary aposteriori truths/statements*.

The explanation of his semantic method requires the introduction of two key concepts: *extension* and *intension*. This pair of concepts represents the *particular framework* that can be recognized in Carnap's semantic as the fundamental device/tool for his modal logic. Extension and intension are explained and applied:

- in the context of the designators where the important notion is *the possible state of affairs*,
- in the context of the belief sentences where the key concept is *the intensional isomorphism*,
- in the method of the name-relation (but, in favor to his method of extension and intension).

What is the relevance of these concepts? These concepts, or his *extension-intension framework*, serve to define basic modal concepts, and provide the answer on his question whether semantic for a *neutral metalanguage* is possible and what is its fundament extension or intension. This issue turns us back to the notion of *necessity and rigidity*, important notion

that can be recognized in Carnap's *possible state of affairs*, and as employed by Kripke in the context of the name as rigid designator. The pre-theoretic notion of rigidity began its life in the semantic of quantified modal logic (QML). It arose in connection with the *objectual* interpretation of QML, where the quantifiers were taken to range over *objects*. The relevance of rigidity can be recognized in the context of modal paradoxes or objections to the coherence of QML. The main issue here is whether rigidity can give a coherent and natural semantic interpretation to QML. This is not surprise since the main issue of QML was what the adequate intended interpretation of quantification should be and Carnap was one who analyzed this from the point of view of *conceptual interpretation* (Church as well, while the objectual interpretation was championed by R. B. Marcus). Carnap's approach was the development of the axiom system for QML according to which variables in modal languages range over individual concepts describable as functions (possibly non constant) from possible worlds to extensions. In respect to the *principle of substitution*, the substitution of terms for two extensionally equivalent individual concepts (i.e. function which yield the same denotation in the actual world) is not possible, but the substitution of terms which denote the same individual concept (e.g. „9“ and „the number of planets“) do not express the same individual concept, for though they are extensionally equivalent there are possible situations in which the extension of „the number of planets“ is different from the extension of „9“ – so, the principle of substitution does not license the substitution of these concepts). Carnap's solution is that any two expressions which express the same individual concept are L-equivalent, or *have the same intension, and therefore they are substitutable, even in modal contexts*. So, Carnap's conceptual interpretation has systematic and logically consistent account of the notion of the satisfaction of an open-modal formula. On his conceptual interpretation there are two ways of rescuing the substitution of co-extensional expressions in extensional contexts (and even quantified version of extensional substitution). He has pointed out that both terms and variables are systematically ambiguous. To each term corresponds both an *extension* and an *intension*, and to each variable *value extensions* and *value intensions*. Since in extensional contexts all that is relevant are the extensions of terms and the value-extensions of variables, once the notion of extensional context is defined (as *wff* of non-modal or higher-order calculus), both extensional substitution and its quantified version can be preserved – which is nothing else than Carnap's method of extension and intension. Thus, our main conclusion is that Carnap's particular framework is the *extension-intension framework* employed to explain the relationship between *meaning* and *modality*.

Kripke's case. Kripke's system is a study of modal logic and corresponding semantic concepts, where basic modal concept necessity (with respect to analyticity and *aprioricity*) is aimed to define one of basic semantic relation of naming relation. In his lectures summed up in his *Naming and Necessity* Kripke defends the main these about naming that belong to semantics and philosophy of language, and theses about necessity that belong to metaphysics. From our analysis it becomes obvious that the arguments for these different theses are interrelated. Kripke was criticized for attempting to derive metaphysical conclusion about the essential properties of things (i.e. possible worlds) from premises in the philosophy of language about the nature of reference and the semantics of proper names. The other interpretation is that Kripke's argumentation goes in other way and that the theses about reference and proper names are derived from metaphysical theses about possible worlds and essential properties. Either way implies the reason to be confused: is it possible „to pull a metaphysical rabbit out of linguistic hat“, or why the understanding of how our language works requires any metaphysical explanation? This controversy Kripke tried to resolve by clarifying the relationship between theses and questions about reference and proper names on the one hand, and theses and questions about necessity and possibility on the other hand. But, it has to be noted that Kripke's contribution was not to connect metaphysical and semantic theses, but to separate them. His intention was to provide a context in which questions about essence of things could be asked *independently* of semantic rules for the expressions used to refer to things. Second important issue was to provide the context in which questions about how names refer could be asked *independently* of question about the nature of things names refer to.

At this point it is necessary to make a brief review on *questions of descriptive semantics, questions of foundational semantics, and those about the capacity and potentiality of the things*. We know that descriptive-semantic theory says what the semantic for the language is, without saying anything about the practice of using that language that explains whether semantic is adequate or not. This theory assigns semantic values to the language expressions and explains how semantic values of complex expressions are function of the semantic values of their constituents – which is something that can be recognized as the *principle of compositionality* used by Carnap. If we reframe this kind of question *in Kripke's terminology we will be concerned with the question of what kind of thing is the semantic value of proper names*. On the other hand, the questions of foundational semantic are about what the facts are that give expressions their semantic values. If we reframe this kind of question *in Kripke's terminology we will be concerned with the question about the semantic value of names* (e.g. what is it about the situation, behavior or mental states of speaker that determine the semantic

value of particular proper name used by the speaker in a particular linguistic community). Third kind of question, when reframed in Kripke's terminology, *is the question of what might have been true of things (such as persons and physical objects) that are the referents of proper names*. As we have seen Kripke provides the answers to each question. Kripke's answer to the descriptive-semantic question about proper names is that the semantic value of name is its referent, which is in its nature the Millian answer. Kripke argues against the opposite answer that semantic value of name is a concept that mediates between name and its referent, namely the concept of definite description. His answer to the foundational-semantic question is that name has the referent that it has in virtue of causal connection of the use of the name and the referent. This means that the referent is the individual that plays the right role in the causal explanation of the particular context in which the name is used. Finally, his answer to the question about the capacity and potentiality of the things that we commonly refer to by names, is that it makes sense to talk about the logical potential of things independently of how it is referred to them (explained by his Shakespeare-example).

Kripke's particular framework is *the possible-worlds framework* where the key concept is necessity (rigidity in the context of names), and it could be understood in the same spirit as Leibnizian slogan „necessity is truth in all possible worlds“. Kripke's framework should not be understood as providing the ontological foundation for a reduction of modal notions, but as formulating the theoretical language in which modal discourse can be uniformed, its structure explained, and equivocation resolved. Kripke recognized that modal discourse is problematic, providing both ambiguities of scope (because the semantic structure of modal statements is complicated and not simply reflected in surface syntax) and ambiguities that arise from alternative senses and context dependence of modal words. Puzzles about, for example, necessary connection and counterfactual dependence, reference to non-existing things, the ability to do otherwise, etc., Kripke tries to resolve by clarifying the discourse in which such problems are posed. His point is that we need a language free of ambiguities that infect modal discourse, where modal claims can be paraphrased and still be powerful to make claims about what might, would or must be true. The main resource of the possible-worlds framework is in ordinary modal language and contains basic assumption that statements about what might be true can be described in terms of the ways a possibility might be realized.

To compare these two frameworks, Carnap's extension-intension framework and Kripke's possible-worlds framework, we have to do that with respect to the specific features and differences between classical and neoclassical theory of meaning.

As a represent of the classical theory Carnap accepts that it is necessary to explain how meaning of word/expressions (used by speakers to refer) is fixed, which is known as intersubjective criteria for applying the words in the language. This theory is supposed to account for necessary truth. As a classical theorist Carnap thought that meaning determines reference, and if speaker knows the meaning of word he knows how to use it to refer. What he presupposed here is that the meaning of word is a set of characters that are necessary and sufficient for it to apply. But, classical theory does not explain how meaning can fix the criterion for word's application in advance. The notion of *fixing the meaning in advance* has to be explained as providing *a priori* criteria, or otherwise it cannot support a doctrine of necessary truth. It follows that without an appeal to necessary truth the classical theory offers no distinction between *semantic criteria* and *empirical criteria* for applying an expression. From the causal theory point of view, the weak spot of classical theory is in its conception of criteria, which cannot support the doctrine of necessary truth.

On the other hand Kripke, as a causal theorist, focuses his attention on the classical theory's identification of meaning with criteria of application and accept the view that there is no *a priori* specification of criteria. His intention was to show that the classical theory's account of analytic truths does not distinguish them from truths based on contingent facts. By his Gödel-example Kripke shows that it is mistake to claim that there is anything stronger than a contingent connection between the criterion for applying the subject of such sentence and the criterion for applying the predicate. He criticized classical theory and developed his alternative theory based on assumption that all criteria of application are grounded in extra linguistic matters of facts, concepts from empirical science, and information about baptismal ceremonies. Kripke concludes that there is conflict between the classical theory's rationalist approach to meaning and its empirical approach to language, which keep the classical theory away from developing the *a priori* account of meaning. The tendency to take empiricist view of language prevents the classical theory form drawing a sharp distinction between *a priori* and *a posteriori* criteria. It is not strange, since the classical theorists conceived natural language as historical products and semantics as systems of contingent belief acquired by each generation. Such conception provides very little chance of constructing a rationalist account of meaning, account that could separate *a priori* from *a posteriori* criterion.

Which framework does better job?

Whose account represents the adequate solution to all fundamental questions they dealt with?

It is not easy to give a final answer to these questions since there are different starting points in both accounts, framed in different way. But, what is obvious is that both frameworks serve the same purpose, to explain the notion of necessity with respect to basic semantic concept of meaning/naming. The *extension-intension framework* does not provide *apriori* account of meaning which is due to the empiricist view of language, which means that its use presupposes specific ontological commitment to possibilities, and in Carnap's case this is represented by his *possible state of affairs*. Generating the special feature of meaning through extension and intension his framework explains the very nature of necessity, trying to overcome the difficulties involved in the translation process of object language sentences (sentences of material mode of speech) into metalanguage and modal sentences into neutral metalanguage. The *possible-worlds framework* already has its source in ordinary modal language. The general strategy here is to find a part of modal discourse free of ambiguities and unclarities that infect modal discourse generally, a part that might be developed and used to clarify the rest. So, if something may be true, then it might be true in some particular way, or if something is possible, then it is possible that it be realized in some particular way or many alternative ways – in the actual world and in the possible world/s. This framework takes alternative specific ways that must be realized as the primitive elements out of which the propositions are built, and in terms of which the modal properties of those propositions are defined. This framework is not free of ontological commitment either, but here we speak about the possibilities such as the ways things might be, counterfactual situations, or possible states of worlds.

These two frameworks have in common one similar concept, namely the concept of *possible state of affairs* (used by Carnap) or the concept of *possible worlds* (used by Kripke). But, the difference is that *the extension-intension framework* does not include nor presupposes the ordinary modal language, which requires the construction of specific linguistic framework and Carnap was inclined to linguistic internalism meaning that we cannot speak from outside the language, but only from within the linguistic frameworks to whose rules we already conform (he admits both internal and external questions as important). On the other hand, *the possible-worlds framework* already presupposes the ordinary modal language and specific linguistic framework sufficient for the intended analysis, which means that no specific or new linguistic framework is necessary in order to deal with main naming/necessity issue.

So, which account represents the adequate solution to all fundamental questions regarding the main meaning/naming-necessity issue?

Our analysis shows that the main benefit of *the possible-worlds framework* is that it permits one to paraphrase modal claims in an extensional language that has quantifiers (and no modal auxiliaries), and so in language in which the semantic structure of the usual modal discourse can be discussed without begging the controversial questions about that structure. This framework provides the base to state and explain both metaphysical and semantic theses since it provides an account of a subject-matter that is independent of languages used to describe that subject-matter.

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