

Carnap's Conventionalism

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ABSTRACT

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In this thesis Carnap's conventionalism is analysed. Carnap's distinction between internal questions of existence and external questions of existence, is the departure point of the analysis. However, it is claimed that we should not confine internal/external distinction with questions of existence.

Following chapters deal with some main issues of Carnap's philosophy such as elimination of pseudo-problems of philosophy, ontological commitment, rationality of scientific theory choice, scientific progress and the relations between linguistic frameworks and scientific theories.

Finally, I suggest the concept of "intentional" rationality as a key concept for understanding Carnap's conventional and pragmatist approach better.

KISA ÖZET

Bu tezde Carnap'ın uzlaşımsalcılığı incelenmektedir. Carnap'ın varlık soruları arasında yapmış olduğu içsel/dışsal ayrımı çıkış noktası alınmış, ancak içsel/dışsal ayrımının uygulama alanının sadece bu sorularla sınırlı kalmaması gerektiği iddia edilmektedir.

İzleyen bölümlerde Carnap'ın felsefesinin bazı temel meseleleri ele alınmıştır. Bunlar, felsefenin sahte-sorunlarının ortadan kaldırılması, ontolojik (varlıkbilimsel) bağlılık, bilimsel kuramların seçiminin ussallığı, bilimsel ilerleme ve bilimsel kuramlarla dilsel çerçeveler arasındaki ilişkilerdir.

Son olarak, Carnap'ın uzlaşımsalcı ve faydacı (pragmatist) yaklaşımını daha iyi anlayabilmek için önemli bir kavram olabileceği düşüncesiyle, “yönelimsel” (intentional) ussallık kavramı ortaya konmaktadır.

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INTRODUCTION

In this thesis I will focus on three main issues which constitute the trivet of Carnap's conventionalism. These are ontological commitment, linguistic approach and rationality of scientific choice. These interrelated issues are going to be scrutinized through the analysis of Carnap's notorious internal/external distinction with respect to questions of existence. As a result of this general analysis, I will argue for the following:

Carnap has developed an anti-ontology that needs to be clearly distinguished from ontological relativism. And because his position was not relativistic with respect to ontological issues, his linguistic approach made it possible for Carnap to suggest a tolerant, unified and practical notion of science.

Rationality of scientific theory choice and linguistic framework choice, then, can neither be defined as merely instrumental nor theoretical but "intentional", which means to encapsulate both without positing them in opposition to each other.

In section I, I will explain the internal/external distinction and try to show its significance as a philosophical skeleton for grasping the problems of Carnapian philosophy as a whole.

Section II will deal with Carnap's criticism of pseudo-problems of philosophy and the elimination of metaphysics. I will also try to show the connections between this criticism and his later views on different issues, such as empirical reality.

In section III, concept of externality will be analyzed with a special emphasis on scientific externality, which has to be interpreted correctly in order to understand Carnap's ideas on rationality of scientific choice and the status of scientific knowledge.

I will try to clarify the differences and show the relations between scientific theories and linguistic frameworks, through the analysis of language of science and language of philosophy in section IV.

In section V, Carnap's anti-ontology will be elaborated in contradistinction to ontological relativism. I will examine the debate between Salmon and Parrini on Carnap's position against scientific realism in order to clarify Carnap's account of ontological commitment and realism.

Finally, section VI will introduce "intentional rationality" as a key concept for my interpretation of Carnap's conventionalism. I am going to suggest this notion for understanding the concept of rationality in Carnapian philosophy comprehensively, instead of antagonizing different types of rationalities.

CHAPTER 1

INTERNAL/EXTERNAL DISTINCTION

In “Empiricism, Semantics and Ontology” (henceforth, ESO) Carnap draws a distinction between external questions of existence and internal questions of existence. He writes: “... we must distinguish two kinds of questions of existence: first, questions of the existence of certain entities of the new kind *within the framework*; we call them *internal questions*; and second, questions concerning the existence or reality *of the system of entities as a whole*, called *external questions*.”¹

In its original and specific form, Carnap introduced this distinction in order to conciliate usage of terms that refer to abstract entities with empiricism in general and with the theory and practice of empirical sciences. Therefore, the internal/external distinction did stem out of a search for the possibility of using such terms in the language of empirical sciences without violating empiricist tenets. Carnap expresses his aim in ESO as such:

Recently the problem of abstract entities has arisen again in connection with semantics, the theory of meaning and truth. Some semanticists say that certain expressions designate certain entities, and among these designated entities they include not only concrete material things but also abstract entities, e.g., properties as designated by predicates and propositions as designated by sentences. Others object strongly to this procedure as violating the basic principles of empiricism and leading back to a metaphysical ontology of the Platonic kind. ... [I]t will be shown that using such a language does not imply embracing a Platonic ontology but it is perfectly compatible with empiricism and strictly scientific thinking.²

¹ “Empiricism, Semantics and Ontology”, in Carnap R., *Meaning and Necessity*, Chicago&London: The University of Chigo Press, 1967, p.206.

² Ibid pp. 205-206.

Nonetheless, we can't confine internal/external distinction within the proper use of abstract entities alone because this distinction serves two main philosophical aims: (1) to build a conventionalist approach, which would enable Carnap to characterize language choice as mere practical without endorsing coherence theory of truth and (2) to determine the logical structure of legitimate scientific and philosophical questions, in contradistinction to pseudo-problems of philosophy (in the sense of traditional metaphysics or ontology).

The first, probably the more complex and challenging, aim has been studied by some philosophers of science within the context of logical empiricism/post-positivism debate, as yielding evidence that makes philosophers to reevaluate the sharp opposition between these two important and competing schools.

The second aim on the other hand represents the characteristic attitude of Carnap against traditional metaphysical philosophy, which originally flourished during Vienna Circle period and lasted throughout his life. Carnap's approach against traditional philosophy was absolutely destructive. Beginning from "Pseudo-Problems of Philosophy" (henceforth, PPP) Carnap dedicated his intellectual efforts to show the mistaken and misleading nature of such problems. This attitude can also be found in his *Logical Syntax of Language* (henceforth, LSL), *Philosophy and Logical Syntax* (henceforth, PLS). Hence "elimination of metaphysics" is not only the name of one of his articles but also a slogan for his philosophical agenda. In order to be able to grasp the significance of the internal/external distinction and to explore the early uses of some important concepts of Carnapian philosophy, such as empirical reality, we must first focus on his analysis of pseudo-problems.

CHAPTER 2

PSEUDO-PROBLEMS OF PHILOSOPHY

Carnap developed the first systematic examination of pseudo-problems in his article “Pseudoproblems in Philosophy”³. This systematic examination was based on the verifiability theory of meaning. According to the theory, a statement is meaningful, if and only if it is verified by possible experience.

Carnap attempts to apply this criterion to realism/idealism controversy in order to show that it is a pseudo-problem. According to him, in opposition to philosophy, there is not a controversy about reality in empirical sciences because,

In physics as well as geography there are certain criteria for the concept of reality in this sense – we want to call it “empirical reality” – which always lead to definite results no matter what the philosophical persuasion of the researcher. The two geographers will come to the same result not only about the existence of the mountain, but also about its other characteristics, namely position, shape, height, etc. *In all empirical questions there is unanimity. Hence the choice of a philosophical viewpoint has no influence upon the content of natural science; (this does not mean that it could not have some practical influence upon the activity of the scientist)*⁴.
[emphasis mine]

He claims that the controversy regarding the reality of the external world originates from the philosophical approach, which goes beyond experience (transcends the realm of experience with the aim of reaching a profound and absolute knowledge of things, not as objects of experience but as things-in-themselves) and therefore its questions are meaningless according to meaning criterion, i.e., verification principle, that I mentioned above.

³ Carnap R., “Pseudoproblems in Philosophy”, in Carnap R., trans. George A. Rolf, *The Logical Structure Of The World & Pseudoproblems In Philosophy*, University Of California Press, 1967.

Carnap's early account of pseudo-problems in this article is basically epistemological in character and determined by a rigid version of the principle of verification as meaning criterion, which was later replaced by a weaker version by Carnap himself, namely the principle of confirmability, which is formulated as: "if it is in principle impossible for any conceivable observational result to be either confirming or disconfirming evidence for a linguistic expression A, then expression A is devoid of cognitive meaning"⁵. The most significant part of his analysis for our aim is the emphasis he puts on "unanimity" in empirical questions. Distinguishing "empirical reality" from the concept of reality that is loaded with metaphysical implications and used to be referred in philosophical controversies such as realism/idealism or realism/nominalism, foreshadows the underlying idea of the internal/external distinction which will be discussed in the following pages. Empirical concept of reality is "The only concept of reality which occurs in the empirical sciences. It is this concept which distinguishes a geographically determined mountain from a legendary or a dreamed mountain, and an experienced emotion from a simulated one."⁶ It is interesting to see that Carnap used "empirical reality" as a synonym of "constructional reality". He says, "The question as to what is real, when it is formulated with the aid of constructable concepts, can only be concerned with this empirical reality; it alone can be posed and treated within the constructional system; hence, we speak here of the "constructional" or "empirical" problem of reality".

⁴ Ibid. 333.

⁵ The reason why Carnap needed to replace principle of verification by principle of confirmability, is his adoption of the idea that absolute verification isn't possible, no matter how high is the quantity of verifications of a statement. He realized that if he tried to hang on principle of verification, he couldn't distinguish scientific statements from metaphysical ones in terms of meaningfulness.

⁶ *The Logical Structure of The World*, p.273.

Therefore we can match internal questions of existence with empirical reality and external questions of existence with the metaphysical one. Thereby comes out another important dichotomy of the two senses of reality which corresponds to internal/external distinction too.

Two Senses of “Reality”

These two uses of “reality” are clearly differentiated in “The Methodological Character of Theoretical Concepts”:

However, I wish to emphasize here that this talk about the admission of this or that kind of entity as values of variables in LT is only a way of speaking intended to make the use of LT, and especially the use of quantified variables in LT, more easily understandable. *Therefore the explanations just given must not be understood as implying that those who accept and use a language of the kind here described are thereby committed to certain “ontological” doctrines in the traditional metaphysical sense.* The usual ontological questions about the “reality” (in an alleged metaphysical sense) of numbers, classes, space-time points, bodies, minds, etc., are pseudo questions without cognitive content. In contrast to this, there is a *good* sense of the word “real” viz., that used in everyday language and in science.⁷ [emphasis mine]

Another piece of his writings in which he elucidates empirical reality is *Philosophy and Logical Syntax*, and his words are almost identical with the quotation from PPP:

When a zoologist asserts the reality of kangaroos, his assertion means that there are things of a certain sort which can be found and perceived at certain times and places; in other words that there are objects of a certain sort which are elements of the space-time system of the physical world. This assertion is of course verifiable; by empirical investigation every zoologist arrives at a positive verification, independent of whether he is a Realist or an Idealist. *Between the Realist and the Idealist there is full agreement as to the question of the reality of things of such and such sort, i.e. of the possibility of locating elements of such and such sort in the system of the physical world. The disagreement begins only when the question about the Reality of the physical world as a whole is raised.* But this question has no sense, because the reality of anything is nothing else than the possibility of its being placed in a certain system, in this case, in the space-time-system of the physical world, and such a question has sense only if it concerns elements or parts, not the system itself.”⁸ [emphasis mine]

⁷ Carnap, “The Methodological Character of Theoretical Concepts”, pp.44-45, in Feigl H. & Scriven M. (ed) *Minnesota Studies in the Philosophy Of Science Vol.1*, Minneapolis: University of Minnesota Press, 1956, pp.38-76.

⁸ Carnap R., *Philosophy and Logical Syntax*, London, Kegan Paul, Trench, Trubner & Co. Ltd., 1935, pp.19-20.

We see from these passages that Carnap fixes the field of scientific study to a specific sense of reality, i.e. empirical reality. By doing so, he aims to protect empirical sciences from the useless metaphysical debates and misleading philosophical problems. This aim is alive in ESO too. In fact as I mentioned above, the underlying idea of distinguishing internal questions of existence and external questions of existence goes back to Carnap's early analysis of pseudo-problems in the Vienna Circle period.⁹ What is novel in ESO is the analysis of the language of science on the basis of internal/external distinction through the method of logical syntax which was developed by Carnap in *Logical Syntax Of Language*. Through this analysis Carnap reaches an interpretation of externality in science, which should be investigated in detail in order to understand Carnap's conventionalism properly.

⁹ See, ESO p.215 and footnote 6.

CHAPTER 3

EXTERNALITY

Internal/external distinction, without a doubt, is the hardcore of ESO, yet it is not the only distinction introduced in that article. Another important distinction, which is made between two types of externality, is discussed in the article too. The first type of externality is represented by the external questions of existence and is characterized in contradistinction to internal questions of existence. According to Carnap, philosophers raise external questions as ontological questions that need to be answered independent of linguistic frameworks. For Carnap, this is of course not a legitimate attitude, because an alleged statement of the reality of the system of entities as a whole is a pseudo-statement without cognitive content. Following Carnap's analysis of pseudo-problems and pseudo-statements from PPP, through LSL to ESO, we can call this type of externality "metaphysical externality".

Carnap's words reveal the characteristics of this type of externality:

From the internal questions we must clearly distinguish external questions, i.e., philosophical questions concerning the existence or reality of the total system of the new entities. Many philosophers regard a question of this kind as an ontological question which must be raised and answered *before* the introduction of the new language forms. The latter introduction, they believe, is legitimate only if it can be justified by an ontological insight supplying an affirmative answer to the question of reality. In contrast to this view, we take the position that the introduction of the new ways of speaking does not need any theoretical justification because it does not imply any assertion of reality. We may still speak (and have done so) of "the acceptance of the new entities" since this form of speech is customary; but one must keep in mind that this phrase does not mean for us anything more than acceptance of the new framework, i.e., of the new linguistic forms. Above all, it must not be interpreted as referring to an assumption, belief, or assertion of "the reality of the entities". There is no such assertion. An alleged statement of the reality of the system of entities is a pseudo-statement without cognitive content. To be sure, we have to face at this point an important question; but it is a practical, not a theoretical question; it is the question of whether or not to accept the new linguistic forms. The

acceptance cannot be judged as being either true or false because it is not an assertion. It can only be judged as being more or less expedient, fruitful, conducive to the aim for which the language is intended. Judgments of this kind supply the motivation for the decision of accepting or rejecting the kind of entities.

Thus it is clear that the acceptance of a linguistic framework must not be regarded as implying a metaphysical doctrine concerning the reality of the entities in question.¹⁰

This paragraph does not only show Carnap's objection to "metaphysical externality" but also introduces another type of externality, i.e., "scientific externality". When he says "it [acceptance of the new linguistic forms] can only be judged as being more or less expedient, fruitful, conducive to the aim for which the language is intended" come we to language choice. I will try to show in the following paragraphs that scientific externality is the proper realm in which language choice is decided and applied.

Scientific Externality

Characterizing language choice as merely practical and securing its legitimacy through a definition of a proper way of external questioning is the second step towards Carnap's conventionalism that was originally formulated in LSL as the "principle of tolerance". The first step was, as I mentioned above, the elimination of pseudo-problems (as metaphysical externality) and confining the realm of science to "empirical reality". The second step is to define philosophy as the logical analysis of language of science, and the liberation of science in terms of being free to choose its language. This second step involves the articulation of what I called "scientific externality". For it aims at developing criteria of language choice, which is of course external to any particular linguistic framework. In contradistinction to "metaphysical externality", "scientific externality" is a legitimate way of questioning (not a pseudo-

¹⁰ ESO p.214.

problem); however its result has no cognitive significance. Following Brian G. Norton's terminology, I will call this kind of external questions "properly formulated" and the others "improperly formulated". According to Carnap the language choice is merely a practical matter and therefore must be approached with a pragmatist attitude. In his formulation of the "principle of tolerance" (henceforth, POT) Carnap clearly states his position: "*It is not our business to set up prohibitions, but to arrive at conventions.*" and "*In logic, there are no morals. Everyone is at liberty to build up his own logic, i.e. his own form of language, as he wishes. All that is required of him is that, if he wishes to discuss it, he must state his methods clearly, and give syntactical rules instead of philosophical arguments.*"¹¹ We find another formulation of POT in the closing paragraph of ESO:

The acceptance or rejection of abstract linguistic forms, *just as the acceptance or rejection of any other linguistic forms in any branch of science*, will finally be decided by their efficiency *as instruments*, the ratio of the results achieved to the amount and complexity of the efforts required. To decree dogmatic prohibitions of certain linguistic forms instead of testing them by their success or failure in practical use, is worse than futile; it is positively harmful because it may obstruct *scientific progress*. ... Let us grant to those who work in any special field of investigation the freedom to use any form of expression which seems useful to them; the work in the field will sooner or later lead to the elimination of those forms which have no useful function. *Let us be cautious in making assertions and critical in examining them, but tolerant in permitting linguistic forms.* ¹²[emphasis mine]

Thus Carnap shows such a linguistic tolerance to science that any form of language can be used at total liberty without asking whether it is the correct one or not. He stresses this point in foreword of LSL too:

The fact that no attempts have been made to venture still further from the classical forms is perhaps due to the widely held opinion that any such deviations must be justified – that is, that the new language-form must be proved to be 'correct' and to constitute a faithful rendering of 'the true logic'.

To eliminate this standpoint, together with the pseudo-problems and wearisome controversies which arise as a result of it, is one of the chief tasks of this book. In it, the view will be maintained that we have in every respect complete liberty with regard to the forms of language; that both the forms of construction for

¹¹ Carnap R., *Logical Syntax of Language*, trans. Smeaton A., London: Routledge & Kegan Paul Ltd. 1937 pp. 51-52.

¹² ESO p. 221.

sentences and the rules of transformation (the latter are usually designated as “postulates” and “rules of inference”) may be chosen quite arbitrarily.¹³

The crucial point at this stage for us to reach a proper interpretation of internal/external distinction is the influence of this liberty over theory choice. How does principle of tolerance, which rules out epistemological superiority between linguistic frameworks and defines the choice between them as merely practical, effect theory choice and theory-fact relations? This question needs to be elaborated in detail in order to clarify Carnap’s position, since it connects our investigations so far to the problems such as the existence of neutral facts and the thesis of incommensurability. One of the most interesting writings of Carnap on these issues is “Truth And Confirmation” which can be interpreted both as a negative and a positive answer to the question I raised above. The last part of the paper is worth quoting in full length:

Closer attention to these two operations [Carnap is talking about (1) Confrontation of a statement with observation and (2) Confrontation of a statement with previously accepted statements] and their mutual relations will help to clarify a number of recently much discussed questions. There has been a good deal of dispute as to whether in the procedure of scientific testing *statements must be compared with facts* or as to whether such comparison be unnecessary, if not impossible. If ‘comparison of statement with fact’ means the procedure which we called the first operation then it must be admitted that this procedure is not only possible, but even indispensable for scientific testing. Yet it must be remarked that the formulation ‘comparison of statement and fact’ is not unobjectionable. First, the concept ‘comparison’ is not quite appropriate here. Two objects can be compared in regard to a property which may characterize them in various ways (e.g., in regard to color, size, or number of parts and so on). We therefore prefer to speak of ‘confrontation’ rather than ‘comparison’. Confrontation is understood to consist in finding out as to whether one object (the statement in this case) properly fits the other (the fact); i.e., as to whether the fact is such as it is described in the statement, or, to express it differently, as to whether the statement is true to fact.¹⁴

Thus it is clear that Carnap approves confrontation of statements with facts. Yet in the following passage Carnap also claims that there are no language-independent or neutral facts:

¹³ LSL p. xiv-xv.

Furthermore, the formulation in terms of ‘comparison’, in speaking of ‘facts’ or ‘realities’, easily tempts one into the absolutistic view according to which we are said to search for an absolute reality whose nature is assumed as fixed independently of the language chosen for its description. The answer to a question concerning reality however depends not only upon that ‘reality’, or upon the facts but also upon the structure (and the set of concepts) of the language used for the description. *In translating one language into another the factual content of an empirical statement cannot always preserved unchanged. Such changes are inevitable if the structures of the two languages differ in essential points.* For example: while many statements of modern physics are completely translatable into statements of classical physics, this is not so or only incompletely so with other statements. The latter situation arises when the statement in question contains concepts (like, e.g., ‘wave-function’ or ‘quantization’) which simply do not occur in classical physics; the essential point being that these concepts cannot be subsequently included since they presuppose a different form of language.... *(This means not only previously accepted statements would have to be rejected; but also that to certain statements – regardless of whether they were held true or false – there is no corresponding statement at all in the new language)*¹⁵ [emphasis mine]

This last paragraph was interpreted by John Earman as “a passage that might have served as an advertisement for Kuhn’s *Structure of Scientific Revolutions*”.¹⁶ He explains why his comment on Carnap’s words is in this direction by concluding that there are the key thesis of “post-positivist” philosophy of science in those passages; namely, nonexistence of neutral facts and incommensurability in the form of failure of intertranslatability. Such a comment is plausible, however there is still a following passage from “Truth and Confirmation” to be quoted here and to be connected with the above quoted passages:

The scruples here advanced regarding the assertion that statements are to be compared with facts (or reality) were directed not so much against its content but rather against its form. The assertion is not false – if only it is interpreted in the manner indicated – but formulated in a potentially misleading fashion. Hence, one must not, in repudiating the assertion, replace it by its denial: “Statements cannot be compared with facts (or with reality)”; for this negative formulation is as much open to objection as to the original affirmative one. In repudiating the formulation one must take care not to reject the procedure which was presumably intended, viz., the confrontation with observation. Nor must the significance and indispensability of such confrontation be overshadowed by exclusive attention to the second operation.... He who really repudiates the first operation – I do not think that anyone in scientifically oriented circles does – could not be considered an empiricist.¹⁷

¹⁴ Carnap R., “Truth And Confirmation” p.125, in Feigl H. & Sellars W. (ed) *Readings in Philosophical Analysis*, Newyork, n.p., n.d.

¹⁵ Ibid. p.125.

¹⁶ Earman, J. “Carnap, Kuhn and the Philosophy of Scientific Methodology” in Horwich P. (ed.) *World Changes*. The MIT Press, 1993.

By these concluding remarks Carnap aims at avoiding some possible misinterpretations; such as deriving a coherence theory of truth from his analysis of the intertranslatability of language forms. This aim can also be found in his reply to one of his critics in *The Philosophy of Rudolf Carnap* (henceforth, Schilpp vol.) in regard to conventionalism:

There I also pointed out that the first operation in the testing of synthetic statements is the confrontation of the statement with observed facts. Thereby I took a position clearly opposed to a pure conventionalism and to any coherence theory of truth. My discussion was implicitly meant to correct some formulations by Neurath, but not his actual views.... At any rate, there cannot be any doubt that Neurath never held this conception [a coherence conception of truth]. Still less can it be attributed to me or to "the physicalists" in general, as critics have sometimes done.¹⁸

This reply was given in a context of being interpreted as a conventionalist, and the text Carnap refers to is "Truth and Confirmation". Carnap's emphasis on the confrontation of statements with facts reminds us of the "empirical reality" and the unanimity in empirical problems, which Carnap has advanced in PPP and PLS. Hence Carnap's position seems to diverge from post-positivistic philosophy of science, because he is asserting an "empirical reality" which yields a basis for the confrontation of statements with facts and also is such a basis that scientists finally come into a complete convergence about problems concerning it (remember the examples of geographers and zoologists). Then how can it be possible for Earman to say that above mentioned passages from "Truth and Confirmation" might have served as an advertisement for Kuhn's *Structure of Scientific Revolutions*, especially when Carnap referred these passages in order to show how wrong it would be to understand his position as pure conventionalism? Such an interpretation may be based on Carnap's own words which seem to give textual evidence, however his words should not be taken as a detailed philosophical account. The texts in question

¹⁷ "Truth and Confirmation", p.126.

¹⁸ Schilpp, P. (ed.) *The Philosophy of Rudolf Carnap*, La Salle, Open Court, 1963, p.864.

are the letters from Carnap to Kuhn, written for the occasion of editorial examination of Kuhn's *Structure of Scientific Revolutions* (SSR), which was originally commissioned as a monograph for the series *Foundations of Unity of Science*. These two letters are quoted by Reisch in order to support his thesis that ideas which were developed by Kuhn in SSR shouldn't be seen as challenging to Carnap's philosophical views.¹⁹

Dear Professor Kuhn:

Thank you very much for sending me your manuscripts. I have read them with great interest, and on their basis I am strongly in favor of your writing a monograph for the Encyclopedia, as you lined out in your letter to Morris of February 13th. I hope that you will find it possible to write your first draft this summer.

I believe that the planned monograph will be a valuable contribution to the Encyclopedia. I am myself very interested in the problems which you intend to deal with, even though my knowledge of the history of science is rather fragmentary. Among many other items I liked your emphasis on the new conceptual frameworks which are proposed in revolutions in science, and, on their basis, the posing of new questions, not only answers to old problems.

I am returning your mss. As educational materials and I will send a copy of this letter to Morris.

Sincerely yours... (12 April 1960)

The second letter goes a little deeper into some issues:

Dear Professor Kuhn:

Simultaneously I am returning your manuscript "The Structure of Scientific Revolution". I am happy that it is now in final form and that the U. of Chicago Press has found a way of publishing it in its full length. I am especially gratified by the fact that we can incorporate this work into the Encyclopedia.

I am convinced that your ideas will be very stimulating for all those who are interested in the nature of scientific theories and especially the cause and forms of their changes. I found very illuminating the parallel you draw with Darwinian evolution: just as Darwin gave up the earlier idea that the evolution was directed towards a predetermined goal, men as the perfect organism, and saw it as a process of improvement by natural selection, *you emphasize that the development of theories is not directed toward the perfect true theory, but is a process of improvement of an instrument*. In my own work on inductive logic in recent years I have come to a similar idea: *that my work and that of a few friends in the step for step solution of problems should not be regarded as leading to "the ideal system", but rather a step for step improvement of an instrument*. Before I read your manuscript I would not have put it in just those words. But your formulations and clarifications by examples and also your analogy with Darwin's theory helped me to see clearer what I had in mind.

From September on I shall be for a year at the Stanford Center. I hope that we shall have an opportunity to get together and talk about problems of common interest.

With best regards yours,...(28 April 1962) [emphasis mine]

¹⁹ George A. Reisch., "Did Kuhn Kill Logical Empiricism?" in *Philosophy of Science*, 58 (1991).

It is understandable to derive a conclusion of Carnap's approval of Kuhn's views from these letters. The examination of the differences and similarities between Carnap's and Kuhn's philosophies are not included within the scope of this study, yet I find it necessary to search for the roots of these differences and similarities (which are sometimes overvalued or overlooked) in Carnap's work especially on the relations between linguistic frameworks and scientific theories.

Let me ask: "is it possible to talk about 'empirical reality' on which there is complete unanimity, if there are no neutral facts?" or "how must we understand the liberty which principle of tolerance (which was called by Carnap himself as "principle of conventionality of language forms") gives to scientists, when Carnap clearly indicates that he took a position that is opposed to pure conventionalism? Both of these questions lead us to investigate the relations between language forms (or linguistic frameworks) and scientific theories, which will finally take us to the problem of ontological commitment.

Before going on with that investigation I want to quote a very interesting paragraph, quoted by Coffa in his "Carnap's Sprachanschauung Circa 1932", which could either help reply our questions or make the case much more confusing for us:

It would be conceivable that each person could make his protocol sentences agree with those of others only with great difficulty or not at all... luckily, in fact we find ourselves in a position to bind together our protocols with those of a hundred other people in a common elaboration. *If someone appears who, on the basis of his protocols, builds a science that is not consistent with the one constructed by our hundred people, then we vote him down; we say of him (depending on the circumstances) that he is colorblind, or a poor observer, or a dreamer, or a liar, or a madman. If one found that against our one hundred there is another one hundred with a common science that cannot be unified with ours, then we couldn't vote them down. In case further research would not lead to agreement we should accept the fact that different groups possess unalterably diverse scientific systems. Luckily, this is not the case.*²⁰ [emphasis mine]

²⁰ Coffa, A. J., "Carnap's Sprachanschauung Circa 1932", in Suppe, F.&Asquith, P. D. (ed) PSA 1976 vol. 2, Michigan: n.p. 1977.

Here is again a passage before us that forces us – maybe forces Carnap, too – to accept there are no neutral facts on which a complete unanimity of observations can ever be gained. In other words, meaning of the observation sentences, and of course observation-terms, are determined or given by conventional means and therefore differ (in varying extents) from one linguistic framework to another. This result would surely destroy the objective character of scientific theories. Notwithstanding this result we need to undertake the possibility of its reverse in the light of the following passage:

Suppose a sentence S is given, some test-observations for it have been made, and S is confirmed by them in a certain degree. Then it is a matter of practical decision whether we will consider that degree as high enough for our acceptance of S, or low enough for our rejection of S, or as intermediate between these so that we neither accept nor reject S until further evidence will be available. Although our decision is based upon the observations made so far, nevertheless it is not uniquely determined by them. There is no general rule to determine our decision. *Thus the acceptance and the rejection of a (synthetic) sentence always contains a conventional component. That does not mean that the decision – or, in other words, the question of truth and verification – is conventional. For, in addition to the conventional component there is always the non-conventional component – we may call it, the objective one – consisting in the observations which have been made.* And it must certainly be admitted that in very many cases this objective component is present to such an overwhelming extent that the *conventional component practically vanishes*. For such a simple sentence as e.g. “There is a white thing on this table” the degree of confirmation, after a few observations have been made, will be so high that we practically cannot help accepting the sentence. But even in this case there remains still the theoretical possibility of denying the sentence. *Thus even here it is a matter of decision or convention.* ²¹ [emphasis mine]

Consequently, when we look at all the passages we have gone through, we see that the common and certain point in all of them is the inevitability of accepting the conventional component in the question of truth and verification and therefore in constructing scientific systems. Nevertheless, Carnap shows an enormous effort not to fall into a pure conventionalism that means to repudiate the first operation²², which Carnap himself accepted as indispensable for empiricists, and to adopt coherence theory of truth. This effort is the consequence of a dilemma which Carnap has tried

²¹ Carnap R. “Testability and Meaning”, p.49, in Feigl H. & Brodbeck M. (ed) *Readings in the Philosophy of Science*, Newyork: n.p. 1953.

to escape. In other words he neither could affirm the absolutistic pretensions of science (in order not to bring science on a par with metaphysics), which would have meant to transcend the language and thus have led to ontological commitments, nor could he ignore the objective basis of science. This dilemma makes us turn our looks on the conventionality of linguistic frameworks and objectivity of scientific theories and how it is possible to conciliate these two, if it is possible at all.

²² See footnote 10.

CHAPTER 4

LINGUISTIC FRAMEWORKS AND SCIENTIFIC THEORIES

There are various views on Carnap's treatment of linguistic frameworks and scientific theories. We can divide these views into two opposing camps. The first camp argues that Carnap treats scientific theories as linguistic frameworks (languages)²³ and the other camp opposes this idea by defending a differentiation of linguistic frameworks and scientific theories in Carnap's philosophy.²⁴ It is indispensable to clarify whether there is an identification of theories and linguistic frameworks because such an identification would effect almost every crucial aspect of Carnap's philosophy, such as incommensurability, scientific progress and ontological commitment.

What makes it difficult to give a fully justified argumentation on the relation between linguistic frameworks and scientific theories is the lack of textual evidence as much as problematic nature of the issue. Despite the vital role of linguistic frameworks for Carnap, he has never given a clear, detailed and exact definition of them. It may be because Carnap himself was not clear on the issue or it was so obvious to him that he has not bothered to define them. However, the second alternative does not sound reasonable, if not totally absurd, when a philosopher like Carnap is in question. That's why I am inclined to believe that it was not completely

²³ Reisch's above referred paper states this claim in the most clear way (p.270).

²⁴ Gürol Irzik and Teo Grünberg focused on this opposition in "Carnap and Kuhn: Arch Enemies or Close Allies?" in *Brit. J. Philosophy of Science*, 46 (1995).

resolved by Carnap either, how to design and justify the relation between a linguistic framework and a scientific theory.

The most problematic facet of this relation is the diverse structures of these two. A linguistic framework is a language form in general, which includes rules of formation that tell us how to build a sentence from certain symbols and rules of transformation that tell us how to connect sentences with each other via inferential relations. As is well known, these rules are purely formal in symbolic languages and can be chosen in absolute freedom, thanks to the principle of tolerance, based on practical grounds. Yet Carnap recognizes the possibility of adding some extra-logical rules to any language form, namely, P-rules. P-rules are physical rules that are supposed to function as primitive sentences, “for example, Newton’s principles of mechanics, Maxwell’s equations of electro-magnetics, the two principles of thermodynamics and such like.”²⁵ “Thus a transformation rule of a language is either an L-rule or a P-rule”.²⁶

When Carnap gives any definition or a specification about the rules of a linguistic framework, the matter in question is of a purely logical nature. By contrast, scientific theories should deal with empirical facts and involve synthetic sentences.

Therefore, it is necessary to combine linguistic frameworks and scientific theories. This necessity also summarizes Carnap’s sinister task, which is conciliating empirical significance of scientific theories with conventionality of linguistic frameworks; i.e., principle of tolerance. Before going on with the analysis of POT, there are still some remarks to be made about linguistic frameworks. As I mentioned above, it is not easy to clarify the structure and the function of linguistic frameworks

²⁵ *Philosophy and Logical Syntax*, p. 51.

²⁶ *Philosophy and Logical Syntax*, p. 51.

exactly. However, it won't be an inappropriate interpretation to understand a linguistic framework – at least a part or a stage of it – as a calculus.

*A syntactical system or a calculus ... [i]s a system of formal rules which determine certain formal properties and relations of sentences, especially for the purpose of formal deduction. The simplest procedure for the construction of a calculus consists in laying down some sentences as primitive sentences (sometimes called postulates or axioms) and some rules of inference.*²⁷

A careful reader can easily detect that Carnap uses “calculus” for synonym of “syntactical system” and after reading the following quotation, he would ask whether it is a deliberate choice or not.

A few years after the publication of the book [LSL], I recognized that one of its main theses was formulated too narrowly. I had said that the problems of philosophy or the philosophy of science are merely syntactical problems; I should have said in a more general way that these problems are metatheoretical problems.... [L]ater we saw that the metatheory must also include semantics and pragmatics; therefore the realm of philosophy must likewise be conceived as comprising these fields.²⁸

The crucial point for our discussion about the relation between linguistic frameworks and scientific theories is to understand the functions of the co-existence of semantics and syntax in the meta-language which is the language of philosophy.

Semantics is the field of study of the relations between expressions of a language and their designata, whereas syntax has nothing to do with these designata and concerns only the expressions and relations between them. Hence, a syntactical system is an uninterpreted calculus and devoid of factual content. The question is, then, whether we can extend the meaning of calculus to scientific theories, which surely need to be empirically significant. We know that Carnap uses “calculus” for scientific theories. For example; “To be sure, in order to pass judgement about the applicability of a given physical calculus we have to confront it in some way or other

²⁷ “Foundations of Logic and Mathematics” p.159, in Neurath O. , Carnap R. , Morris C. (ed.) *Foundations of the Unity of Science* Vol.I, Chicago & London: University of Chicago Press, 1991.

²⁸ “Intellectual Autobiography”, p.56.

with observation, and for this purpose an interpretation is necessary”²⁹ or “...[w]e can first construct a calculus and then lay down the interpretation intended in the form of semantical rules, yielding a physical theory as an interpreted system with factual content. The customary formulation of a physical calculus is such that it presupposes a logico-mathematical calculus as its basis.”³⁰ These are not random quotations that show Carnap’s use of the term “calculus”. They also show that Carnap treated scientific theories as *interpreted calculi*. Therefore, we can bifurcate calculus as such: calculus with a semantical system, i.e. interpreted calculus, and calculus without a semantical system, i.e. uninterpreted calculus. Now I am returning to POT, in order to see whether Carnap applied the principle to scientific theories.

The principle of tolerance was originally formulated by Carnap as a principle which excludes any logical prohibitions from developing new language forms. Forms of construction for sentences of a language and the rules of transformation may be chosen arbitrarily.³¹

The question is whether it is possible to apply the same principle to scientific theories since every scientific theory requires a linguistic framework. If the answer to this question will be positive, then POT can be revised as “Principle of Conventionality of Scientific Theories” which means to assert such a proposition: “Besides the fact that there are no morals in logic, it is also true that there are no morals in science with respect to choice of scientific theories”. I don’t think that Carnap would have been in favor of such a claim. For, at least in two pieces of his writings we can see that he talks about cumulative insight and scientific progress positively: “To decree dogmatic prohibitions of certain linguistic forms instead of

²⁹ “Foundations of Logic and Mathematics”, pp. 208-209.

³⁰ Ibid pp.198-199.

³¹ LSL pp. xiv-xv.

testing them by their success or failure in practical use, *is worse than futile; it is positively harmful because it may obstruct scientific progress.*"³² [emphasis mine]

According to my interpretation of these words, Carnap had a conception of science which is not merely a matter of convention, when he states that prohibitions of language forms would be positively harmful to scientific progress. If he had thought that scientific theories and therefore scientific knowledge were mere results of conventional decisions just like language forms, why would he find it positively harmful to prohibit some of these conventions? No positive harm would have occurred since they were merely conventions. The only thing that would have occurred in the case of a prohibition would be the acceptance of this language form instead of that, which would mean the restriction of the liberty of choosing language forms. If we call a prohibition positively harmful, then there must be something to be harmed positively through that prohibition and this cannot be the choice of language forms because there is nothing to be harmed in an arbitrary choice. In another place Carnap gives us another clue of his conception of scientific progress:

This education in historical carefulness and a neutral attitude seemed to me useful and proper for the purpose of historical studies, but not sufficient for training in philosophy itself. The task of the history of philosophy is not essentially different from that of the history of science. *The historian of science gives not only a description of the scientific theories, but also a critical judgment of them from the point of view of our present scientific knowledge.* I think the same should be required in the history of philosophy. This view is based on the conviction that *in philosophy, no less than in science, there is the possibility of cumulative insight and therefore of progress in knowledge.*³³ [emphasis mine]

Note that these are the words of Carnap in his Intellectual Autobiography, which was published in 1963. It seems to me that he is in full awareness and satisfaction of his position with regard to scientific progress, which clearly presupposes cumulative insight in scientific knowledge and through this cumulative knowledge a critical

³² ESO p.221.

³³ "Intellectual Autobiography" p.41.

judgment of previous theories becomes possible. If Carnap finds it not only possible but also necessary to give a critical account of former scientific theories through our present scientific knowledge, then he can't identify scientific theories with linguistic frameworks, which are chosen, arbitrarily, through pragmatic considerations. It is clear that if he thought scientific theories were identical with linguistic frameworks he would not have suggested a critical judgment, which surely means to recognize epistemological superiority of some theories over others. Hence there must be an objective basis that makes it possible to talk about continuity in scientific knowledge and thereby scientific progress. The problem that we are facing here is the meaning of the term 'objective'. First of all Carnap never uses this term as a synonym of 'absolute truth'. It is clear that Carnap is against absolutism in science and sees it as a disease caused by pseudo-problems of philosophy.³⁴ Objectivity should rather be understood as intersubjectivity. Recalling the quotation from Coffa's paper, we can say that Carnap admits a possibility of the presence of "unalterably diverse scientific systems" on the basis of the possibility of constructing different observation languages which cannot be translated into each other completely. However, he thinks that such a condition has never occurred, *luckily*, for science. The need for understanding objectivity as intersubjectivity becomes clearer when we analyze Carnap's division of language of science into observational and theoretical languages. Carnap admits that the line between these two languages is by no means sharp. This line is drawn arbitrarily for the aim of obtaining a foundation on which scientific practice can be performed. Vagueness of this distinction seems to be realized and moreover taken for granted by Carnap:

A predicate 'P' of a language L is called observable for an organism (e.g. a person) N, if, for suitable arguments, e.g. 'b', N is able to under suitable circumstances to come to a decision with the help of few observations about a full sentence, say

³⁴ LSL sec. 78.

'P(b)', i.e. to a confirmation of either 'P (b)' or '~P (b)' of such a high degree that he will either accept or reject 'P (b)'.

This explanation is necessarily vague. There is no sharp line between observable and non-observable predicates because a person will be more or less able to decide a certain sentence quickly, i.e. he will be inclined after a certain period of observation to accept the sentence. For the sake of simplicity we will here draw a sharp distinction between observable and non-observable predicates. By thus drawing an arbitrary line between observable and non-observable predicates in a field of continuous degrees of observability we partly determine in advance the possible answers to questions such as whether or not a certain predicate is observable by a given person.³⁵

These remarks show us how Carnap treated observation. But we should always keep in mind that he is suggesting to determine some *predicates* of a language as “observable”, not to determine some *entities* as observable. In other words, he is proposing a practical attitude with regard to use of a language.

A philosopher might object that the intensity of an electric current is not really observed. Only a pointer position was observed. An ammeter was attached to the circuit and it was noted that the pointer pointed to a mark labeled 5.3. Certainly the current's intensity was not observed. It was *inferred* from what was observed.

The physicist would reply that this was true enough, but the inference was not very complicated. The procedure of measurement is so simple, so well established, that it could not be doubted that the ammeter would give an accurate measurement of current intensity. Therefore, it is included among what are called observables.

*There is no question here of who is using the term “observable” in a right or proper way. There is a continuum which starts with direct sensory observations and proceeds to enormously complex, indirect methods of observation. Obviously no sharp line can be drawn across this continuum; it is a matter of degree.*³⁶

[emphasis mine]

So once observation terms and observation sentences of a language L are decided upon, objectivity of that particular language is secured. “...although what counts as an observation term and consequently as an observation sentence is somewhat arbitrary and language-dependent...once such sentences are decided upon, they provide an objective basis relative to L for confirming and disconfirming hypotheses

³⁵ “Testability and Meaning”, pp. 63-64.

³⁶ Carnap R., *Philosophical Foundations of Physics*, (ed) Gardner M., Newyork & London: Basic Books Inc. Publishers, 1966, p.226

within the theory with the help of methodological rules.”³⁷ Such an interpretation is supported by Carnap’s reply to one of his critics:

Cohen believes that my so-called principle of tolerance in the logical syntax contains a “doctrine of conventionally chosen basic-truths”. But this is not the case. The principle referred only to the free choice of the structure of the language, and not to the content of synthetic sentences. I emphasized the non-conventional, objective component in the knowledge of facts, e.g., in [1936-5]. There I also pointed out that the first operation in the testing of synthetic statements is the confrontation of the statement with observed facts. Thereby I took a position clearly opposed to a pure conventionalism and to any coherence theory of truth.³⁸

Carnap emphasizes his approval of confrontation of statements with observed facts, in order to show that he preserved the *non-conventional* component in the knowledge of facts. Thus we have reason to believe that there is no identification of linguistic frameworks with scientific theories, since linguistic frameworks are merely conventionally accepted or rejected, whereas scientific theories have to deal with the testing of their synthetic sentences by confronting them with observed facts. Yet this does not seem satisfactory because we can not conclude comfortably that Carnap has a conception of neutral-facts in the sense of being independent of language.³⁹

Besides, such a conception of neutral-facts presupposes an observation language which is capable of serving as a foundation for any linguistic framework. Carnap is clearly against such an idea. Then the objective basis of science, for Carnap, lies in the idea that when a linguistic framework is decided to be *used* for a certain purpose, scientific theories, which are built in this linguistic framework, can be judged objectively. I now turn to Carnap’s analysis of scientific theories.

³⁷ Irzik, G. and Grünberg, T., “Carnap and Kuhn: Arch Enemies or Close Allies?” pp. 294-295

³⁸ *Schilpp* vol. p.864

³⁹ See footnote 10.

Language of Science

As I mentioned above, Carnap divides the language of science into two parts; the observation language and the theoretical language. First, I want to focus on observation language, which is widely accepted as less controversial than theoretical language by philosophers and Carnap himself. An examination of theoretical language will follow and finally Carnap's solution for connecting these two properly will be discussed.

Observation Language

According to Carnap, the observation language consists of sentences that are completely understood by a community and contains no theoretical terms in it. Nevertheless, it may contain logical terms. "It is assumed that the terms of *Vo* [observational vocabulary] designate directly observable properties or relations, and that their meanings are completely understood. In view of the simple logical structure of *Lo* [observation language] it is further assumed that all sentences of this language are completely understood."⁴⁰ It means that a complete interpretation of *Lo* is given. The crucial part of this account of observation language is its being a proposal. Carnap does not say that meanings of the observation terms and observation sentences are given ostensively by the act of observation⁴¹; rather, it is presupposed that anyone who uses that language understands them in the same way. Carnap is aware of the difficulty in finding a unanimous definition of the term 'observable', since philosophers and scientists are likely to use the term in many different ways. Here is how he understands it. "There is no question here of using the term 'observable' in a right or proper way. There is a continuum that starts with direct

⁴⁰ *Schilpp vol. p.959.*

⁴¹ I follow the interpretation of Irzik and Grünberg.

sensory observations and proceeds to enormously complex, indirect methods of observation. Obviously no sharp line can be drawn across this continuum; it is a matter of degree.”⁴²

Nonetheless, even observation language is in need of meaning postulates, e.g., A-postulates (analyticity postulates) in order to define meaning relations between its descriptive terms. One important point to bear in mind is that neither O-terms nor A-postulates tell us anything about the actual world. Use of any O-term and/or an A-postulate is only about the purpose which a language is constructed to serve for and therefore only a matter of pragmatic consideration.⁴³ This is because protocol sentences do not refer to an absolute “given”. Indeed, Carnap wrote on this issue:

For our purposes we may ignore entirely the question concerning the content and form of the primary sentences (protocol sentences) which has not yet been definitely settled. In the theory of knowledge it is customary to say that the primary sentences refer to “the given”; but there is no unanimity on the question what it is that is given.⁴⁴

Nevertheless, although the fact that protocol sentences do not refer to “the given” makes alternative systems of protocols possible, the possibility of alternative systems should not lead us to deny the objectivity of science. Let me recall the passage I quoted in section III:

It would be conceivable that each person could make his protocol sentences agree with those of others only with great difficulty or not at all... Luckily, in fact we find ourselves in a position to bind together our protocols with those of a hundred other people in a common elaboration. *If someone appears who, on the basis of his protocols, builds a science that is not consistent with the one constructed by our hundred people, then we vote him down*; we say of him (depending on the circumstances) that he is colorblind, or a poor observer, or a dreamer, or a liar, or a madman. If one found that against our one hundred there is another one hundred with a common science that cannot be unified with ours, then we couldn't vote them down. In case further research would not lead to agreement we should accept the fact that different groups possess unalterably diverse scientific systems. Luckily, this is not the case. [emphasis mine]

⁴² *Philosophical Foundations of Physics*, p. 226.

⁴³ *Philosophical Foundations of Physics*, p. 263 & “Testability and Meaning” p. 76-77.

⁴⁴ Carnap R., “The Elimination of Metaphysics Through Logical Analysis” p.63, in Ayer A. J. (ed) *Logical Positivism*, The Free Press, 1959.

The last sentence of this paragraph summarizes Carnap's position well. He believed that unalterably diverse scientific systems could have been built on the basis of entirely different observation languages, but this possibility has never been actualized. For this reason the mere logical possibility of the existence of alternative observation languages does not undermine the objectivity of the actual science.

Theoretical Language

Let me now turn to the nature of theoretical language. First of all, we need to place "the problem of theoretical language" in its proper context. I call it a problem, because it has been widely discussed among philosophers, whether a theoretical language is necessary and if so, how it could be constructed and used as a meaningful instrument for natural sciences. This problem preoccupied Carnap as well and requires careful attention in order to clarify the relationship between linguistic frameworks and scientific theories, as well as foreshadowing some important aspects of the rationality of scientific change.

Carnap focused on the issue once more, in the *Schilpp* vol., in a reply to

Hempel about scientific theories:

Hempel discusses the following methodological question. Since the purpose of scientific theories is to establish predictive connections between data of experience, is it not possible to avoid the theoretical language and work with observation language alone? In a detailed discussion Hempel gives convincing reasons for the thesis that this is not possible, in other words, that theoretical terms are indispensable for the purposes of science. His main argument is based on the point that a scientific theory has the task of establishing not only deductive relations but also inductive relations among observational data. I believe that Hempel was the first to emphasize clearly this important point. However, the question of the exact way in which the inductive relations should be established in a comprehensive language like *L* constitutes a difficult and so far unsolved problem⁴⁵

⁴⁵ *Schilpp* vol. p. 960.

As it is pointed out in this quotation, the inevitability of inductive relations in science compelled Carnap to develop an account of theoretical language such that empirical meaningfulness (the possibility of deriving predictions of observable events) and experiential import (the possibility to learn something about observable events) are secured. Thus, I can turn to the details of Carnap's articulation of theoretical language, after having shown the importance of the problem briefly.

For Carnap, primitive constants of a theoretical language LT, is divided into two parts: logical and descriptive. Descriptive primitives of LT are called VT, e.g. theoretical vocabulary. After this bifurcation, Carnap introduces another important distinction between theoretical postulates (T) and correspondence rules or postulates (C). In a scientific theory, theoretical postulates give the basic laws, and correspondence rules connect VT with VO, since theoretical language has no independent interpretation by itself, in other words it is an uninterpreted calculus and T is an uninterpreted postulate system.⁴⁶ Therefore, C-rules, which are mixed sentences involving both T-terms and O-terms, have an essential role in a scientific theory; they connect theoretical and observation languages and thereby secure the empirical significance and experiential import of the theory and of the theoretical language in general.

The important point in this account for our purposes is that theoretical postulates partially determine the meaning of theoretical terms, thus meaningfulness of a term becomes relative to a theory. The importance of this point lies in the fact that, relativized meanings of T-terms might lead to a conclusion that Carnap's account gives way to meaning incommensurability⁴⁷. Following Irzik&Grünberg, I will call this "thesis of semantic incommensurability" .

⁴⁶ Carnap, "The Methodological Character of Theoretical Concepts" pp.44-47.

⁴⁷ Irzik and Grünberg emphasized this point in, "Carnap and Kuhn: Arch Enemies or Close Allies?"

In their paper Irzik&Grünberg, claim that Carnap adhered to semantic holism. By semantic holism they mean “the doctrine that theoretical postulates of a theory contribute to the meaning of theoretical terms occurring in them and that a change in the theoretical postulates results in a change of meaning.”⁴⁸ This claim is clearly supported by textual evidence. I will only quote two passages here:

In contrast, the meaning of the theoretical terms of V_t generally go beyond what is directly observable. However, a partial interpretation of the theoretical terms and of the sentences of L containing them is provided by the following two kinds of postulates: the *theoretical postulates* in which only terms of V_t occur, and the *correspondence postulates* which are mixed sentences.⁴⁹

and

This fact shows that the specification, not only of the rules C , but also of the postulates T , is essential for the problem of meaningfulness. The definition of meaningfulness must be relative to a theory T , because the same term may be meaningful with respect to one theory but meaningless with respect to another.⁵⁰

In the light of these textual evidences, Irzik&Grünberg take a step further and claim that semantic incommensurability as untranslatability of languages “is a direct consequence of Carnap’s semantic holism”. Textual evidence for Carnap’s endorsement of untranslatability of languages can be found in the following passage:

In translating one language into another the factual content of an empirical statement cannot always be preserved unchanged. Such changes are inevitable if the structures of the two languages differ in essential respects. For example: while many statements of modern physics are completely translatable into statements of classical physics, this is not so or incompletely so with other statements. The latter situation arises when the statement in question contains concepts (like, e.g., ‘wave-function’ or ‘quantization’) which simply do not occur in classical physics; the essential point being that these concepts cannot be subsequently included since they presuppose a different form of language.⁵¹

After reading these passages, someone might ask whether it is right to apply semantic incommensurability to observation language too. Irzik&Grünberg give an affirmative answer to the question. They defend their point through coupling

⁴⁸ Ibid p.289.

⁴⁹ *Schilpp vol.* p.959.

⁵⁰ Carnap, “The Methodological Character of Theoretical Concepts” p.48.

⁵¹ Carnap, “Truth and Confirmation” p.126.

Carnap's physicalism with his views on common content of diverse sentences. Here is how they formulate it.

Carnap's physicalism asserts that every protocol sentence expressing the content of an experience can be translated into the physical language with the help of certain laws such that the two sentences have the same meaning... Couple this physicalism with the view that two sentences share a common content if one can be inferred from the other. To the extent that such inferences presuppose the laws of currently accepted theories, what we get is no less than the theory-ladenness of the meanings of observation terms. [Bibliographical references are omitted]⁵²

This argument seems fair enough in terms of reasoning; however, a reference which was omitted in the quotation above, i.e. *Philosophy and Logical Syntax*, p.57-58, needs some special attention. Let me first quote this passage from Carnap.

The content of a sentence represents its sense, so far as the word "sense" is intended to designate something of a purely logical character. ...All questions of sense having an actually logical character can be dealt with by the formal method of syntax.
Sometimes two sentences of quite unlike wording nevertheless have the same sense, as asserting the same state. We will call such sentences equipollent. The formal definition is obvious: two sentences are called equipollent if they have the same content, in other words if they are consequences of each other.

It is obvious that Carnap's words are about a syntactical rule and therefore has to be interpreted as being related to only purely logical issues. It is a questionable result that this passage can be referred as an evidence for Irzik&Grünberg's argument, which is about the empirical content of observation sentences.

Yet, there is other textual evidence in Carnap's work that can be interpreted in favor of the thesis of incommensurability of observation sentences. What I have in mind is Carnap's account of the relation between theoretical laws and empirical laws. According to Carnap, an empirical law is a law which contains terms that refer to observables – directly or by relatively simple techniques – but not any theoretical terms. Adding to this characterization, Carnap takes empirical laws as serving for the

⁵² Irzik&Grünberg "Carnap and Kuhn: Arch Enemies or Close Allies?" pp.292-293.

function of explaining observed facts and predicting future observable events.⁵³ The crucial point about the relation between empirical laws and theoretical ones is the explanatory and the inventive role of the latter over the former. “... The theoretical law helps to explain empirical laws already formulated, and to permit the derivation of new empirical laws. Just as the single, separate facts fall into place in an orderly pattern when they are generalized in an empirical law, the single and separate empirical laws fit into the orderly pattern of a theoretical law”.⁵⁴ This relationship between two different⁵⁵ types of laws needs to be discussed with a special attention on the terms *derivation* and *explanation*. Before going on with this discussion, we should clarify how these two types of laws are to be arrived at. Empirical laws are arrived at through a relatively simple process. A scientist “observes certain events in nature. He notices a certain regularity. He describes this regularity by making an inductive generalization.”⁵⁶ On the other hand, theoretical laws can not be arrived at so easily. “It might be supposed that he could now put together a group of empirical laws, observe some sort of pattern, make a wider generalization, and arrive at a theoretical law. Such is not the case.”⁵⁷ How, then, a theoretical law is arrived at? Carnap replies this question by characterizing a theoretical law as a *hypothesis*, not a generalization. “... [n]o amount of generalization from observations will ever produce a theory of molecular processes. Such a theory must arise in another way. It is stated not as a generalization of facts but as a hypothesis. ... [F]rom the hypothesis, certain empirical laws are derived, and these empirical laws are tested in turn by

⁵³ *Philosophical Foundations of Physics*, p.226-227.

⁵⁴ *Ibid* p.229

⁵⁵ They are different with respect to the terms they include. Empirical laws contain only observation terms, on the contrary, terms of a theoretical law do not refer to observables.

⁵⁶ *Philosophical Foundations of Physics*, p.228.

⁵⁷ *Ibid* p.228.

observation of facts.”⁵⁸ Hence, we can conclude that, theoretical laws differ from empirical laws not only by the terms, which they contain, but also by the process through which they are arrived at. Now let me turn to the issue of derivation of empirical laws from theoretical laws. Since theoretical laws are concerned with non-observables, it is not possible to claim that empirical laws are directly deduced from them. Derivation of empirical laws from theoretical ones must bear on something different from a simple logical deduction, as Carnap himself says: “The statement that empirical laws are derived from theoretical laws is an oversimplification. It is not possible to derive them directly because a theoretical law contains theoretical terms, whereas an empirical law contains only observable terms. This prevents any direct deduction of an empirical law from a theoretical one.”⁵⁹ What we need to derive an empirical law from a theoretical one is the system of correspondence rules, according to Carnap. As it is mentioned in the previous parts of this section, correspondence rules are mixed sentences, which contain both theoretical and observation terms. They are used as a *dictionary* that helps scientist to connect observables with non-observables. The important point for our purpose is whether theoretical laws, and thereby theoretical terms, contribute to the meaning of observable terms. Because if such is the case, we can conclude that semantic incommensurability is true for observation terms, as well as theoretical ones. In order to clarify this point we need to focus on the function of correspondence rules again. We know that correspondence rules connect theoretical terms with observation terms, and thereby help to secure the empirical significance of theoretical terms. However, there might be another function of them that is to explain observable terms

⁵⁸ Ibid p. 230.

⁵⁹ Ibid p. 232.

and establish some unknown relations between them. Carnap's words can help us understand this better:

There is a temptation at times to think that the set of rules [correspondence rules] provides a means for defining theoretical terms, whereas just the opposite is really true. A theoretical term can never be explicitly defined on the basis of observable terms, although sometimes an observable can be defined in theoretical terms. For example, "iron" can be defined as a substance consisting of small crystalline parts, each having a certain arrangements of atoms and each atom being a configuration of particles of a certain type.⁶⁰

It is possible to claim that the meaning of "iron" is re-established or expanded through such a definition, which is made on the basis of a theoretical law. Some unknown facts about "iron" can also be discovered by means of this definition.

Another example, which is given by Carnap, on this issue is about the kinetic theory of gases:

One correspondence rule states that the temperature of the gas corresponds to the mean kinetic energy of the molecules. Another correspondence rule connects the pressure of the gas with the impact of molecules on the confining wall of a vessel... [T]hus, by means of correspondence rules, the pressure that is measured macroscopically by a manometer (pressure gauge) can be expressed in terms of the statistical mechanics of molecules....[M]any of the empirical laws for gases were known, of course, before the kinetic theory was developed. For these laws, the theory provided an explanation. In addition, the theory led to previously unknown empirical laws.⁶¹

We see from so far quoted passages and our discussion that an empirical law is an inductive generalization of observed facts, whereas a theoretical law is developed as a hypothesis, which is connected to observables by means of correspondence rules, and after the connection is established, it defines observables and furthermore, makes it possible to derive new empirical laws and predict new phenomena not previously observed.

Thus, we can conclude that if theoretical laws makes it possible to reach new empirical laws and contribute to the explanation of some observables in a novel

⁶⁰ Ibid p.234.

⁶¹ Ibid p.241.

way, then it follows that meanings of observables are changed or interpreted – no matter how partially – by theoretical laws and/or terms. This conclusion, without a doubt, means that we can assert the application of thesis of semantic incommensurability to observation language.

CHAPTER 5

ONTOLOGICAL COMMITMENT: RELATIVIZED OR REJECTED?

In the previous sections, we saw Carnap's accusation of traditional philosophy of creating pseudo-problems in the form of improperly formulated external questions. Almost all of these problems originate from the metaphysical approach, which aims at finding answers to questions that concern the ontological status of entities without any reference to linguistic frameworks. Instead of this metaphysical approach, which inevitably leads to ontological commitments, Carnap developed a position that can be labeled as ontological neutrality. In his *Intellectual Autobiography* Carnap writes:

Only much later, when I was working on the *Logischer Aufbau*, did I become aware that in talks with my various friends I had used different philosophical languages, adapting myself to their ways of thinking and speaking. With one friend I might talk in a language that could be characterized as realistic or even as materialistic; here we looked at the world as consisting of bodies, bodies as consisting of atoms; sensations, thoughts, emotions, and the like were conceived as physiological processes in the nervous system and ultimately as physical processes. Not that the friend maintained or even considered the thesis of materialism; we just used a way of speaking which might be called materialistic. In a talk with another friend, I might adapt myself to his idealistic kind of language. ... Only gradually, in the course of years, did I recognize clearly that my way of thinking was neutral with respect to the traditional controversies, e.g., realism vs. idealism, nominalism vs. Platonism (realism of universals), materialism vs. spiritualism, and so on. When I developed the system of the *Aufbau*, it actually did not matter to me which of the various forms of philosophical language I used, because to me they were merely modes of speech, and not formulations of positions.⁶²

These remarks reveal Carnap's motivation that underlies his principle of tolerance.

This time, he seems to be tolerant by being neutral with respect to ontology. How should we understand the notion of neutrality then? Does Carnap allow scientists and philosophers of science to choose and preserve their ontology in their scientific

systems, just like he allows any language form to be used without being necessarily correct? No, he does not. In fact if he had approved such an ontological relativism, he would have destroyed his own principle of tolerance and furthermore his linguistic program. If every linguistic framework adopts some ontology of its own then it will no more be possible to determine the rules of frameworks solely on linguistic grounds. This is because logical syntax is constructed on the principle of defining linguistic frameworks with regard to syntactical and semantical rules, not on the basis of ontological commitments. And the principle of tolerance is built upon the idea that acceptance of a language form does not involve any extra-linguistic components such as ontological commitments, no matter whether they are relative or universal. Therefore the principle of tolerance can be built and justified not through an ontological relativism but anti-ontology. Carnap defines his anti-ontology as a replacement of ontological theses by practical decisions concerning the use of languages.

We now replace the ontological theses about the reality or irrealty of certain entities, these which we regard as pseudo-theses, by proposals or decisions concerning the use of certain languages. Thus realism is replaced by the practical decision to use the reistic language, phenomenalism by the decision to use only the phenomenal language, and traditional psycho-physical dualism by the decision to use a dualistic language; and so on.⁶³

One possible objection to this is that ‘ontology’ does not necessarily imply metaphysical pretensions of existence about entities; in other words, a scientific and hence legitimate ontology could be possible within empirical reality. This objection is a plausible one since Carnap himself accepts that empirical sciences are really concerned with objects.

It is perhaps hardly necessary to emphasize the fact that this conclusion [to free logical analysis from reference to extra-linguistic objects through translating material mode of speech to formal mode of speech] applies only to *logical analysis*,

⁶² “Intellectual Autobiography”, pp. 17-18.

⁶³ *Schilpp vol.* p.869.

and that there is no question of eliminating reference to objects themselves from *object-sciences*. On the contrary, these sciences are really concerned with objects themselves, with things, not merely with thing- designations.⁶⁴

However, only after fourteen pages, he defines questions about space-time as such: “Thus all questions about the structure of space and time are *syntactical* questions, that is, questions about the structure of the language, and especially the structure of the formation and transformation rules concerning space and time co-ordinates.”⁶⁵ I believe these two passages clearly show us that Carnap’s concept of “empirical reality” defines the realm of empirical sciences and let them practice in that realm without being bothered by useless and pseudo problems of philosophy. On the other hand, he did not even come close to a philosophical position, which recognizes ontology as a theoretical discipline, which is supposed to study ontological status of entities without reference to linguistic frameworks.

Carnap’s anti-ontology is also a key concept for understanding his conventionalism better. As I mentioned before, Carnap endorses both the conventional and the non-conventional components in acceptance or rejection of synthetic sentences. This gave rise to a debate about whether Carnap is a scientific realist or an instrumentalist. In order to comment on this debate I will look at Wesley Salmon and Paolo Parrini’s opposing theses.

Wesley Salmon suggests in his article “Carnap, Hempel, and Reichenbach on Scientific Realism”⁶⁶ that it is a misinterpretation to claim that Carnap embraced any form of scientific realism. Salmon quotes a passage by Carnap as a reply to the Hempel’s essay in the Schilpp volume.

⁶⁴ *Philosophy and Logical Syntax*, p.72.

⁶⁵ *Ibid* p.86.

⁶⁶ Salmon W., “Carnap, Hempel, and Reichenbach on Scientific Realism” in Salmon W. & Wolters G. (ed) *Logic, Language, and the Structure of Scientific Theories*, Pittsburgh: University of Pittsburgh Press/ Universtatverlag Konstanz, 1994.

Hempel discusses . . . the following methodological question. Since the purpose of scientific theories is to establish predictive connections between data of experience, is it not possible to avoid the theoretical language and work with observation language alone? In a detailed discussion Hempel gives convincing reasons for the thesis that this is not possible, in other words, that theoretical terms are indispensable for the purpose of science. [Carnap's bibliographical footnote is omitted here] His main argument is based on the point that a scientific theory has the task of establishing not only deductive relations but also inductive relations among observational data. I believe that Hempel was the first to emphasize clearly this important point.

Following this quotation, Salmon says that "One's first reaction to Carnap's response might be to suppose that Hempel had persuaded Carnap to embrace some form of scientific realism . . . I now think, however, that this was a misinterpretation."

According to Salmon, Carnap approves Hempel's analysis as an external question that is properly formulated, e.g., not in a metaphysical way, but in a pragmatic way that concerns scientific externality, and Carnap is in agreement with Hempel on using a linguistic framework incorporating theoretical language. Salmon concludes that no ontological commitment is involved in Carnap's views. He justifies his claim by referring to Carnap's reply to Grünbaum. Carnap's attitude against realism in his reply does not leave any room for misunderstanding: "If 'realism' is understood as a preference for the reistic [physical thing] language over the phenomenal language, then I am also a realist. However, if 'realism' is understood, in the customary sense, as an ontological thesis, then the arguments against it were given in my monograph [*Scheinproblem in der Philosophie*].⁶⁷ Salmon concluded: "... although he made a valiant effort, Hempel does not seem to have converted Carnap to a realistic position. It appears that Carnap did not retreat from the position he held in 1950."

Paolo Parrini's views on the same issue are quite different from Salmon's. Parrini argues that Carnap can be interpreted as a scientific realist. His main argument hinges on the distinction, which I already emphasized, between empirical

⁶⁷ *Schilpp* vol. p.870.

and metaphysical reality. Taking this distinction as a basis, Parrini introduces another distinction namely; ontological vs. ontic commitment. He believes that such a dichotomy of commitments is not only possible but also necessary to understand Carnap's position in the right way, because he finds it absurd that Carnap rejects any ontological commitment. Here are his words:

But the distinction between empirical and metaphysical realism certainly makes it possible to say that Carnap may accept some ontological (or better, ontic) commitment at the level of empirical realism and at the same time that he may refuse any ontological commitment at the metaphysical level, inasmuch as any kind of entity, observable or theoretical, concrete or abstract, is concerned – just this is the claim of Carnap (1956,44f.) where there also recurs the juxtaposition between two notions of reality (the first metaphysical, the other “good”, scientific, i.e., empirical). Carnap is a scientific realist, provided that the realist component of his scientific realism be understood in the empirical sense, not in the metaphysical one.⁶⁸

If it is not only a matter of terminological confusion on ‘scientific realism’ Parrini is clearly misinterpreting Carnap's distinction between empirical and metaphysical reality. Carnap's acceptance of empirical reality while rejecting metaphysical reality has nothing to do with accepting *ontic* commitments while rejecting ontological ones. What Carnap wants to show via this distinction is the difference between the language of science and of traditional philosophy, which inevitably leads to ontological commitments. In the text Parrini refers to, Carnap attempts to clarify the proper use of the term “real” in contradistinction to its metaphysical use. Let me quote from that text:

However, a question about the reality of something like electrons in general . . . or the electromagnetic field in general is of a different nature. A question of this kind is in itself rather ambiguous. But we can give it a good scientific meaning, e.g., if we agree to understand the acceptance of the reality, say, of the electromagnetic field in the classical sense as the acceptance of a language LT and in it a term, say ‘E’ and a set of postulates T which includes the classical laws of the electromagnetic field . . . as postulates for ‘E’.⁶⁹

⁶⁸ Parrini P., “With Carnap, Beyond Carnap” p.267, in *Logic, Language, and the Structure of Scientific Theories*.

⁶⁹ “The Methodological Character of Theoretical Concepts” p.45.

Again, Carnap is talking about the acceptance of a language and a term in it. It is not possible to derive from these words neither ontological nor ontic commitments which would mean to embrace some kind of realism. The only thing that Parrini could attribute to Carnap through these references and analysis is *linguistic realism*. Here is why I call it linguistic realism. As I presented in chapter 4, problems of philosophy are meta-theoretical in that they concern the analysis of the structure of language – three main components of this structure are pragmatics, semantics and syntax.⁷⁰ Therefore, the language of science is the object language of the meta-language (language of philosophy). This is such an obvious and profound distinction that its significance is in danger of being overlooked. However it is the very heart of the problem of ontological commitment. When Carnap stated that philosophical problems are meta-theoretical, what he wanted to emphasize was the formal character of the language of philosophy. It is because of this formal character that the internal/external distinction was introduced and improperly formulated external questions were eliminated. According to POT, a scientist is free to choose any language for describing the world. For example, he may choose a phenomenalist or a physicalist language for that purpose. If he chooses the former, he may be interpreted naturally to commit himself to sense-data as the ultimate furniture of the world. According to Carnap, this commitment is a commitment merely *within* the linguistic framework chosen. If the scientist chooses the physicalist language, then similarly he will be committing himself to physical objects such as tables, mountains and atoms. Again, this is a commitment *within* the linguistic framework of physicalism. From outside of these frameworks, such choices appear as conventional. Since every scientific theory is expressed and developed within some linguistic

⁷⁰ “Foundations of Logic and Mathematics”, p. 146.

framework, any ontological thesis of a scientific theory and the commitment of a scientist to it is nothing but a revelation of a linguistic decision. In short, the only type of ontological commitment that can be compatible with Carnap's conventionalism is an internal, analytic, trivial⁷¹ and linguistically instrumentalized one.

Thus we come back to the internal/external distinction in regard to Carnap's conception of scientific reality. In ESO Carnap says "to be real in the scientific sense means to be an element of the system" (p.207) in order to show that this concept (scientific reality) can't be applied to the system itself and therefore questions which are addressed to the reality of the system as a whole do not serve any meaningful scientific purpose. According to Carnap, "to recognize something as a real thing or event means to succeed in incorporating it into 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*" [emphasis mine]. The framework in question is the "thing language", which is chosen as an example by Carnap (no need to say that thing language is not the only possible one). If we see Carnap's argument "to be real is to be a part of the system" as a part/whole relation, we come to the dilemma which I mentioned on page 18. Carnap's aim can be formulated as "founding a science which has no pretensions of absolute truth without losing its objective basis".

It is also possible to grasp Carnap's conventionalism through such a conception of science. I think Carnap believed that science can and should be treated as a unified system in which different scientific theories can be constructed. Nevertheless, these theories are not incommensurable, since they are all formulated

⁷¹ *Schilpp vol. p. 871.*

in a common language (physical language) according to Carnap.⁷² Although physical language is chosen as the most efficient or most fruitful one for scientific purposes, but not as the *correct* language to do science, after the decision is made the objective basis of science can not be doubted. Theories, which are constructed within the “language of science”, are commensurable unless an entirely divergent science is born. Hence scientific knowledge can be judged on objective criteria and thereby scientific progress is possible. Every particular scientific theory can be tested to see if it is true or false as part of the overall scientific system without asserting any absolute truth. But we should never forget that unalterably diverse scientific systems are possible, however, *luckily this is not the case.*

⁷² LSL p.320.

CHAPTER 6

RATIONALITY OF CHOICE

I can – perhaps must – begin examining rationality in Carnapian philosophy, by questioning the title of this section. When we say “choice” there is obviously a decision in question. However, it is not that obvious which decision it is; is it the choice of a linguistic framework or the choice of a theory? As I tried to show in section IV these two are not identical but closely related to each other, both structurally and practically in Carnap’s philosophy. Therefore, a choice about one of them cannot be evaluated without considering the other. Before going forward, let me recall some of the points that I emphasized in previous sections.

First of all, for Carnap, linguistic choice is a practical decision. As he has expressed in the definition of POT there are no morals in logic. Every scientist, then, is in total liberty to choose his/her language form, through which scientific processes are going to be carried out. Another important point is that meaning postulates and the correspondence rules of a linguistic framework significantly affect on scientific theories, to such an extent that degree of confirmation of a theory becomes relative to the linguistic framework.⁷³ Finally, Carnap was clearly opposed to any kind of absolutistic pretensions of science and he rejected any philosophical position – including realism – that involves ontological commitments. I must also add to these points that internal/external distinction is crucial for understanding the type of

⁷³ *Schilpp vol. p. 988.*

rationality that governs scientific choice, because this distinction isn't only a technical one about questions of existence, but also an overall separation of two distinct ways of reasoning.

It is a very widely adopted attitude to discuss Carnap's understanding of rationality of scientific choice through some contradistinctive terms and definitions such as, instrumental/theoretical or relativistic/universalistic. Using these distinctions may be plausible to grasp Carnap's views yet it is still somehow misleading. Here is why: Carnap's conventionalism inherits such a characteristic that it detains us giving a definition of it in terms of oppositions. It is not because of a philosophical weakness, rather because of its negative character. With "negative" I mean that Carnap's conventionalism –his concept of rationality too – mostly aims to show us what is mistaken and illegitimate through a systematic negation and give the best possible suggestion instead. Hence, it is not always an easy task to clarify and analyze Carnap's position by using historical or customary oppositions. Let me look at instrumental/theoretical contradistinction in order to clarify my point.

As I tried to show in the previous sections, Carnap's account of linguistic frameworks recognizes a total liberty to everyone in language choice since this choice cannot and need not be justified theoretically. Thus, there are only pragmatist or instrumentalist criteria for language choice. On the other hand, theoretical justification can be discussed only after the decision is made and the rules are set. This account taken for granted, it is possible to claim that Carnap attributed two distinct types of rationality to language choice. And since language choice and possible further regimentations in the chosen language affect the choice of scientific theory and scientific research directly, this dichotomy should be binding for science in general. However, we should not overlook the fact that theoretical rationality that

governs internal justifications is governed by the instrumental rationality, namely, in the final analysis theoretical rationality is merely an *instrument* that serves for securing proper functioning of the instrument itself; i.e. the linguistic framework. In other words, instrumental rationality is prior to theoretical rationality, both logically and chronologically. Any theoretical (internal) justification or reasoning is possible if and only if the external decision is already made by means of instrumental rationality. Therefore, such a distinction does not suffice to enclose the concept of rationality of Carnap's philosophy.

I believe that we should understand Carnap's conception of rationality in general, and specifically rationality of scientific choice, as an open-ended version of Kant's transcendental idealism. Although he has never mentioned such a similarity between his philosophy and Kant's, I will try to explain the basic common idea between them. As is well known, Kant has distinguished sensibility and understanding as the two fundamental faculties of human intellect, which are the source of knowledge. I will not, of course, go into detail of Kantian philosophy here. What I want to show is, presence of a linkage between Kant's commitment to some concepts and forms (pure concepts of understanding and pure forms of sensibility) which were supposed to be common to all human beings and unchanging and Carnap's conception of rationality. Today we all know very well that it was a desperate attempt to determine and fix such concepts or mental faculties of human intellect. Nevertheless the idea of suggesting – either through logical means or a bio-neurological method – a general structure of human intellect and rationality is still alive. I believe that Carnap had such an underlying idea in mind during every period of his philosophical career. He was surely aware of the practical and socio-historical factors that affect the development of science, philosophy and any human activity.

However, he was somehow disposed to believe that despite the individual and cultural differentiations, human kind is able to constitute a basic and common intersubjective rationality. This rationality was not supposed to give the final answers or the absolute truth of course, but at least could keep human beings believing in the virtue of questioning. We can call this idea of an intersubjectively objective rationality “the intentional rationality” for the reason that it is characterized by the intention of constituting a unified *human* rationality – at least in science and philosophy – that is supposed to be emancipated from the burden of metaphysics. And Carnap suggested adopting instrumentalism as the best possible way to constitute such rationality. Consequently, it seems that Carnap believed that human beings are fundamentally instrumentalist creatures.

As I mentioned above, these ideas have never appeared as a clear philosophical analysis in Carnap’s corpus. Nevertheless I take the risk of bad philosophizing in exchange of the possibility of understanding a monumental philosopher a little better.

CONCLUSION

Throughout the thesis I tried to analyze different aspects of Carnap's conventionalism, now, it is time to make some final remarks on it.

First of all, why do we call it “conventionalism”? We do so because Carnap's philosophy is pragmatist, instrumentalist and inter-subjectivist. As we saw in previous chapters, language choice is a practical matter, according to Carnap, and since every philosophical and/or scientific effort has to be carried out within a language, it is not possible to transcend the language and examine the reality *as if* there is only one correct way of doing it. This “as if” approach was eliminated by Carnap as a metaphysical one, and internal/external distinction was introduced in order to show that all theoretical examinations are internal and relative to a linguistic framework and the only legitimate way to transcend a linguistic framework is to question its convenience as an instrument. However, although Carnap was an instrumentalist in this sense, he did not reduce science to a play ground, in which every scientist seeks his own toy to entertain himself. For Carnap, a unified science was possible, at least reasonable, on the basis of inter-subjectivity. He stated that everyone must have the total liberty to choose or build his/her own language, and believed that this liberty would not undermine the objectivity of science, on the contrary it could help to establish a wider and a richer science. This belief made Carnap to claim that scientific progress is possible. “Progress” does not, of course,

mean to come closer to the absolute truth. It is rather understood as becoming able to unify science more strictly and properly, both diachronically and synchronically.

Carnap defined philosophy as the analysis of the language of science. Philosophy, according to Carnap, has nothing to do with reality. And this is not a negative or a humiliating definition for philosophy, on the contrary, it aims at assigning the proper objectives to philosophy instead of metaphysical pretensions. Hence, philosophy becomes a method rather than a doctrine.

Through these characterizations of philosophy and science, we can conclude that for Carnap human knowledge is based on conventions, which need not to be justified since, justification is an internal process that is possible only after we decide which convention is going to be used.

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