

University of Economics in Katowice

Volume 7

2011

Journal of

**Economics &
Management**

Grażyna Musiał

**ERNEST NAGEL
AND ECONOMIC METHODOLOGY.
A NEW LOOK**

Economic methodology, at any rate in the second half of the 20th century, developed partially through the process of terminological and conceptual acquisitions and borrowings from the philosophy of science – so claim, for instance, the authors of *The Handbook of Economic Methodology*, 1998¹. Analytical philosophy, an influential current in the Anglo-Saxon philosophy of science, was represented by Ernest Nagel, Carl Gustav Hempel and others. Their scholarly achievements were a source of many important subjects for consideration for the methodology of economics. There were the issues of the cognitive status of the theory, problems of explaining in various types of sciences, the question of value judgements in social sciences. This literature inspired the methodology of economics with many classical subjects that contributed to emergence of new investigative perspectives. One should mention here the instrumentalism in Milton Friedman's presentation, or the operationalism as interpreted by Paul Anthony Samuelson.

The object of the paper is to emphasise these particular features of the concept of science in Ernest Nagel's interpretation that are believed to be of special importance, also for the methodology of economics as they contributed to working out a new outlook for that science. As we are aware of the specificity of assumptions of Nagel's concept, we have given a lot of space to presentation of these assumptions and this is reflected in the very structure of the paper.

Another subject of our interest concerns two issues of methodology. The first of them is the cognitive status of theory and the second one is the problem of descriptive and appraising judgements in science. The issues are among central questions in methodology. Both questions evoke discussions and polemics. The paper will present Ernest Nagel's general assumptions² on the structure of science, taking into consideration basic types of scientific theories and their properties. Nagel worked out the types of conceptions of scientific theories as soon as at the beginning of his independent scientific activity and he presented the conceptions in a developed form in his book: *The Structure of Science: Problems in the Logic of Scientific Explanation*³. The book is a source of inspiring

¹ *The Handbook of Economic Methodology*. Eds. J.B. Davis, D. Wade Hands, U. Mäki. Edward Elgar Publishing, Cheltenham, UK, Northampton, MA, USA 1998, p. XV.

² P. Suppers: *Ernest Nagel 1901-1985. A Biographical Memoir*. National Academy of Science. Washington D.C 1994.

³ E. Nagel: *The Structure of Science: Problems in the Logic of Scientific Explanation*. Collective translation: Jerzy Giedymin, Bozydar Rassalski, Helena Eilstein. PWN, Warsaw 1970. Review of the book: L. Nowak: *Prawo nauki, teoria, determinizm. O „Strukturze nauki” Ernesta Nagla [The Law of Science, Theory, Determinism. On Ernest Nagel's "The Structure of Science"]*. "Człowiek i Światopogląd" 1972, No. 2, pp. 158-185. Reprint: "Philosophy Science" 1972, Vol. 39, No. 4, pp. 533-547; *Idealization and Concretization*. Ed. T.A.F. Kuipers. University Press, Groningen 1980, pp. 148-153.

conclusions and is regarded as one of fundamental works on the contemporary methodology of science. The position of the American scholar, Ernest Nagel is considered classical and as such, worth of detailed analysis. A new outlook on the methodological significance of the issue of the cognitive status of theory emerged on the basis of the interpretative views and comments for which the work was a reference plane.

In the study, 'theory' means a subsystem of a particular theoretical system, which is built of sentences containing, apart from descriptive terms, at least one theoretical term, i.e. a descriptive term denoting a non-observable property. There is an issue that constantly triggers off discussions, namely the epistemological problem whether a theory is vested with a logical value: truthfulness or falseness. A theory is successful when it is source of predictions that are significant and consistent with experience, leads to productive practical applications and affords satisfying explanations. The essence of the problem is rendered by the question whether a theory can be formulated as true or false statements and if so, in what sense?

In *The Structure of Science*, the author distinguished three main positions on the problem of the cognitive status of theory. These are: a descriptive (positivist) conception of theory, an instrumentalist conception of theory and a realistic conception of theory. Prior to presenting the conceptions in more detail, two issues must be clarified. The first one is the view that philosophy affords science with research assumptions. In view of the fact that the terms 'science' and 'philosophy' can be understood in different ways, one must state precisely that they may apply either to actions (a pragmatic understanding in Kazimierz Ajdukiewicz's meaning), or to creations (an apragmatic understanding), i.e. to statements and sets of statements.

The other issue that needs explanation is the correlation between respective understandings of the term 'assumption' as well as between the pragmatic and apragmatic comprehension of science and philosophy. There is no doubt that logical understandings are linked with the pragmatic approach since logical relations are based on statements. It is senseless to say that an action is a logical reason for another action, that an action is a logical reason for a proposition and that a proposition is a logical reason for an action. And one more preliminary statement: philosophical assumptions may be of ontological, epistemological or methodological nature. This explanation important since methodology in the

above meaning (as a component part of philosophy) is distinguished from the methodology of sciences as a positive science on methods⁴.

Further on, a short characteristics of three types of theory conceptions in Ernest Nagel's interpretation are presented.

The descriptive conception of theory

According to the descriptive conception of theory, science does not fulfil an explanatory role, but a descriptive function⁵ and as a result, it is not possible to assign to theories – theoretical statements – logical value of truth or falsehood. Since in this perspective, a basic function of theory is a description of the factual reality, an assumption is made that theoretical statements are translatable into statements on observable objects, as well as into propositions on observable events and on relations between events as expressed colloquially and in a common sense way. According to that conception, theory formulates relations occurring between observable events and phenomena. A difficult problem in the conception is how theoretical propositions can be 'translated' unequivocally into sentences of the autonomous language of sensual data.

⁴ The essence and structure of philosophical thinking have been presented vividly and resourcefully by the German researcher and scholar Wolfgang Kersting. He compared philosophising to a multi-floor building. On each floor, philosophy assumes a different form and expression. And thus:

- from the cellars, some dark and faint voices reach our ears,
- from the kitchen rooms, sometimes applause and sometimes complaints can be heard,
- in the guest rooms, an unceasing party for the congress participants is in progress,
- in the master's study on the first floor, avant-guard articles and column pieces are created,
- in the living-room, there is a talk-show, they strike while the iron is hot,
- a flurry of activity is in the stairwell, essayists who can write on the run are crowding there,
- others bring out bulky volumes and thin pamphlets from the library and distribute them among the audience,
- philosophy (i.e. methodology) has been chased away to the attic due to its incurable inclination to abstraction and generalisation.

See: W. Kersting: *The Equality of Chances and Self-Fulfilment*. In: *Etyka życia publicznego [The Ethics of Public Life]*. Eds. K.M. Cern, P.W. Juchacz, E. Nowak. Series: COOPERA – VOL. VII. Wydawnictwo Naukowe Instytutu Filozofii. The Adam Mickiewicz University in Poznań, Poznań 2009, pp. 13-14). Kersting is concerned with social philosophy. One of his latest works is the book: *Gerechtigkeit und Öffentliche Vernunft. Über John Rawls' Politischen Liberalismus*, 2006. Polish readers know his article: *Spoleczeństwo jako postulat [The Society as a Postulate]*, published in the periodical of the Jagiellonian University "PRINCIPIA" (Editor: Jan Hartman), 2004, which contains conception works on philosophy and theoretical sociology.

⁵ Descriptivism treats scientific explanations as concise descriptions that facilitate the task of making accurate forecasts. Descriptivism is believed to be a simplified form of conventionalism and instrumentalism. See: M. Blaug: *The Methodology of Economics. (The Methodology of Economics Or How Economics Explain*. London 1980). Translation: Bogusław Czarny in collaboration with Alina Molisak. Wydawnictwo Naukowe PWN, Warsaw 1995, p. 359.

Nagel formulates the following opinion on the issue: '(...) the descriptive conception of science encounters difficulties since (...) the autonomous language of bare contents of sensations actually does not exist and the chances for constructing such a language are small. Elementary sensual data, expressed as a psychological fact, do not constitute by any means the original contents of experience which all our ideas are constructed of (...)'⁶.

With the translatability of sentences in the above context, the semantic (logical) equivalence is of utmost importance. Nowadays, in order to mitigate slightly the above condition, the existence has been assumed of not just a single observational proposition, but of a whole class of observational propositions as logically equipollent to the particular theoretical statement.

The instrumentalistic conception of theory

Another conception that does not attribute a logical value (truthfulness or falsehood) to theories in pronouncements on reality is the instrumentalistic⁷ conception of theory. According to the conception '(...) theory is believed to be a rule or a principle of analysing and symbolic presentation of certain data of common experience and at the same time a tool for deriving some observational propositions from others'⁸.

Theories are to help in organising sensual data and not to explain relations between them. They are interpreted as mental tools that contain expressions not denoting object that exist in reality. In place of the descriptive function, theory has been attributed intermediary and instrumental functions in research. According to the concept, theories are to a greater or lesser degree useful tools of conclusion that leads us from facts to forecasts. A decisive criterion of selection of theories (hypotheses) is not truthfulness, but effectiveness, simplicity and convenience.

Although both the descriptive position and the instrumentalistic one are in opposition to the position of realism, for contemporary debates, various versions of the instrumentalistic position are important. The essence of the position consists in the fact that it generalizes a particular experience and it allows to make predictions besides.

The position of scientific realism, as adopted in opposition to that of instrumentalism, is formulated in different ways.

⁶ E. Nagel: Op. cit., p. 115.

⁷ Instrumentalism is defined as a methodological position according to which all theories and scientific hypotheses are solely instruments used for creating predications. M. Blaug: Op. cit., p. 122.

⁸ E. Nagel: Op. cit., p. 122.

The realistic conception of theory

Realism, i.e. the realistic conception of theory, attributes a completely different cognitive status to theory. Realism in the ontological plane assumes the existence of an objective reality as external to the cognizing subject. Realism in the epistemological plane assumes cognizability of reality by the subject.

A central place in most of positions of scientific realism is occupied by the notion of truthfulness (true) as conceived in a classical manner. Scientific theories should be true or at least approximately true. The realistic presentation of theory leads to evaluation of scientific theories in categories of conformity of their contents with the fragments or aspects of reality as described by those theories, i.e. it is based on the classical definition of truth.

Truth, as understood in the classical sense, means that there is a relation of correspondence between the carrier of truth and facts. Truthfulness, as comprehended in the classical manner, is an ideal that governs scientific research, an ideal limit that is aimed at by the research. Nowadays, few scholars still claim that truth comprehended in the classical manner is actually attainable in science. Advocates of the classical conception of theory have substantiated its validity in different ways. While focusing on the criticism of instrumentalism, they did not pay much attention to a precise presentation of their position. Truth as a border notion is understood in a classical manner. Science heads for the truth.

Thus, the realistic conception of truth assumes that a correct theory represents reality, describes it in an approximately correct way and therefore, it may be evaluated in cognitive categories of truth and falsehood.

The sense of the expressions 'physical reality' or 'physical existence' is not clear. In any case, the authors using these terms do not understand them in the same way. Therefore, one should take into consideration various criteria which are usually referred to, expressively or tacitly, when the physical reality of scientific objects postulated by scientific theories is either affirmed or negated.

Nagel lists the following criteria of physical reality:

- the requirement that a particular object or event should be perceived in an inter-subjective manner in given conditions,
- the requirement that the term denoting something physically real should occur in more than one experimental law,
- the requirement that the term denoting something physically real should occur in a verified causal law, either theoretical or experimental one, with some established meaning of the word 'cause'⁹.

⁹ E. Nagel: *Op. cit.*, pp. 136-140.

The criteria mentioned by Nagel are to explain the sense of phrases occurring in various contexts and attributing physical reality to objects. The first criterion is the best known and popular criterion of reality of anything. The point is that the object or event should be perceived in an inter-subjective manner in given conditions. However, a dilemma occurs as related to the fact that most of the objects postulated by science, if not all of them, are not real in that meaning. The author gives an example of molecular theory. The aim of the theory is not to provide information on sensually perceived features of genes, but to enable understanding and predicting of events occurring and interrelations between the structural schemes (otherwise: theories according to Nagel) which are the points of reference. Even if we assumed hypothetically that the object of studies molecular biology, i.e. genes, is observable, this would still not change the sense of the theoretical notions used for characterising the objects. To conclude, one may say that the physical reality of theoretical objects is without any special importance for science and its development. However, many philosophers and scholars use the term 'real' in a positive tone, in spite of explicit negations on the theory side and to the detriment of precision.

Upon the review of the types of conceptions of theories and the analysis of their cognitive status, the question arises which of these conceptions, Ernest Nagel, the author, is in favour of.

Many methodologists believe that Nagel was a philosopher who did not declare for any on the positions on the issue of the cognitive status of theory. Nagel himself did not speak explicitly in favour of any of the positions. Nevertheless, basing on some remarks pronounced by him, we should think that he inclined to the position of instrumentalism. It was noticeable when he said that the discrepancies in assumptions between the realistic view and the instrumentalistic one were verbal rather than substantial¹⁰. This is a typical feature of an instrumentalist.

¹⁰ E. Nagel: Op. cit., p. 141. See also: K. Zamiara: *Metodologiczne znaczenie sporu o status poznawczy teorii. Z problemów związków między metodologią nauk i teorią poznania*. PWN, Warszawa 1974; P. Zeidler: *Spór o status poznawczy teorii. W obronie antyrealistycznego wizerunku nauki*. Wydawnictwo Naukowe Instytutu Filozofii. Vol. IX. Uniwersytet im. Adama Mickiewicza w Poznaniu, Poznań 1993; J. Woleński: *Epistemologia*. Vol. III. *Prawda i realizm*. Aureus, Kraków 2003; I. Nowakowa: *The Idea of "Truth as a Process". An Explication*. In: *Idealization III: Approximation and truth*. Eds. J. Brzeziński, L. Nowak. "Poznań Studies in the Philosophy of the Sciences and the Humanities" 1992, Vol. 25. Adam Mickiewicz University, Amsterdam – Atlanta, GA.

Ernest Nagel's position left numerous opened questions that were further developed. This pertains in particular to the problem of the terms occurring in scientific laws, the problem of causality and the issue of reduction.

Nagel distinguished two types of reduction: a homogeneous reduction and a heterogeneous (ontological) one. The homogeneous reduction pertains to theories offered for explanation of phenomena within the same branch of knowledge and using related notions. The heterogeneous reduction pertains to theories using different systems of conceptualisation and aimed at explaining phenomena that seemingly different.

Nagel was convinced that homogeneous reductions do not pose any greater problems and he even failed to treat them in a systematic manner. However, it soon turned out that in relation to very those reductions, one of the most difficult problems, or at least the most persistently reoccurring ones, was raised, namely the problem of incommensurability of theories as raised by Kazimierz Ajdukiewicz, Thomas Samuel Kuhn, earlier by Pierre Duhem¹¹ and recently by Grażyna Musiał¹².

In the light of Nagel's conception, each case of reduction constitutes an explanation of the theory reduced. At the same time, Władysław Krajewski¹³ pointed out that not every case of reduction can be acknowledged as explanation. Krajewski applied the term 'correspondence' to denote the cases of relations between theories for which Nagel used the term 'reduction'.

A certain form of reductionism in social sciences, the sciences of man, was behaviourism which aimed at demonstrating the principles ruling human behaviours by examining only causes of those behaviours, i.e. stimuli. Behaviouristic theories are not incapable of explaining acts of human consciousness, but cannot deal with human acts at all. Behaviourism is a science on reacting and not on acting. And the whole problem is related to the issue of understanding the category of causality, than to the broad question whether scientific theories should be interpreted instrumentalistically or maybe realistically. We shall come back to the latter further on.

¹¹ K. Ajdukiewicz: *Obraz świata i aparatura pojęciowa* [*The Image of the World and Notional Apparatus*]. In: Idem: *Język i poznanie* [*Language and Cognition*]. Vol. 1. PWN, Warsaw 1960; T.S. Kuhn: *The Structure of Scientific Revolutions*. Fundacja Aletheia, Warsaw 1970; P. Duhem: *The Aim and Structure of Physical Theory*. Princeton University Press, Princeton 1954.

¹² G. Musiał: *Współczesna metodologia nauk ekonomicznych. Perspektywy rozwoju* [*Contemporary Methodology of Economic Sciences. Development Prospects*]. In: *Ekonomia jako obszar badań naukowych – trendy, perspektywy rozwoju* [*Economics as an Area of Scientific Researches – Trends, Development Prospects*]. Ed. B. Kos. University of Economics, Katowice 2010.

¹³ W. Krajewski: *The Principle of Correspondence and the Growth of Knowledge*. Reidel, Dordrecht – Boston 1977.

As we said at the beginning of the paper, we are discussing the cognitive value of scientific theories in the light of the philosophy of science. Ernest Nagel's position has been used in order to consider specific implications of assumptions of his positions for the research practice of the sciences that are detailed in relation to philosophy. At present, attention should be paid to the position taken by Milton Friedman on the matter¹⁴. He related the value of theory in economics to the possibility of formulating forecasts based in on the theory. He considered any value vested in theory, such as truth, as insignificant. Milton distinguished the following issues of theories:

- firstly, hypotheses do not need to be true. An economic theory is not weakened by the fact that the underlying premises do not have to meet the condition of truthfulness and they may be false. There is no requirement in Friedman's book for the premises to be true,
- secondly, economic theories seldom postulate the existence of unobservable objects,
- thirdly, for economists, not all possible predictions are important but only those that are interesting to them.

Roughly, in the same manner as above, the position of the American economist on the status of theory – also labelled as instrumentalistic – was presented in the book *Metodologia nauk*¹⁵. An opinion was expressed there that the position is only slightly related to instrumentalism as a view on the cognitive value of a scientific theory the philosophy of science. There are also some scholars within the methodology of economics who voice their criticism of Friedman's instrumentalism¹⁶. It is not clear why a theory provides prognoses and at the same time, the theory is not able to explain why the prognoses come true. A weak link of the argumentation presented in both of the sources quoted is the value of hypotheses.

Another problem which should be raised here is the issue of descriptive and appraising judgements in science. In his book *The Structure of Science. Problems in the Logic of Scientific Explanation*, Nagel expressed the opinion that science as a social undertaking cannot function without methodological evalua-

¹⁴ We are talking about M. Friedman's (1953): *Essays on Positive Economics* and its methodological part *The Methodology of Positive Economics*.

¹⁵ A. Grobler: *Metodologia nauk [The Methodology of Sciences]*. Wydawnictwo AUREUS, Wydawnictwo ZNAK, Kraków 2006, pp 253-254, annex no. 3. The annex by: Jacek Cachro. Series: "Kompendia Filozoficzne".

¹⁶ M. Blaug: Op. cit., pp. 148-159.

tions. It may free itself, however, from any references to appraising or normative value judgements. As for the first issue, he explained that: ‘There cannot exist a social science which is free of evaluations since the relation to values is included not only in conclusions reached by the scholar but also in the very data assessment’¹⁷. As regards the second question, Nagel wrote: ‘We have no adequate reasons to suppose that there is a basic inability to distinguish descriptive and appraising judgements included in many statements, irrespective of whether the statements are expressed by scientists investigating social phenomena or natural ones’¹⁸.

Before we get to the core of the dilemma: an argument on facts versus an argument on values, we must say that a significant part of the heritage of logical empiricism is some elements of views of its representatives on the relation between descriptive and appraising judgements. They are in favour of separability of those types of judgements. They deny that appraising judgements have the value of truthfulness; in other words: these judgements do not fulfil the prerequisite of having the value of truthfulness. Two different issues can be considered with regards to this problem. The first one: are appraising judgements rightly denied the value of truthfulness; the second one: is the justification of the thesis that appraising judgements do not have the value of truthfulness acceptable.

It seems that it is possible to conclude the argument about facts, as presented by Nagel, since objective data (evidence) may be decisive here. The argument about values may be solved by appealing to persuasion. The effectiveness of the letter depends in turn on the values shared by the parties.

Nagel’s distinction is important. In his opinion, controversies concerning facts are less disputable than those concerning values. Otherwise, according to Grobler: ‘The evaluative burdening of a theory does not cause any additional methodological problems, whereas making abstractions more theoretical is a source of additional methodological problems’¹⁹.

Methodological judgements are helpful at attaining agreement about statements of the ‘what-it-is-like’ type. They differ in many ways from the judgements applied in order to attain agreement about values. The interaction of facts and values gives dynamism to the development of science. It is equally important for social sciences as for natural ones. A progress in science occurs when scholars aim at maximising the significance of facts rather than minimising the significance of values.

¹⁷ E. Nagel: *Op. cit.*, p. 424.

¹⁸ *Ibid.*, p. 423.

¹⁹ A. Grobler: *Op. cit.*, p. 239.

Kazimierz Ajdukiewicz distinguished three methodological types of sciences. These are: a) nomothetic or explaining type, b) idiographic or reporting type, c) axiological or evaluating type. If economics – a science of the axiological type in Kazimierz Ajdukiewicz's classification – is to develop, economists' priority must be creating and testing of falsifiable economic theories.

No statements that are established as definitely true once and for all, in consequence, we can only arrive at suppositions that have successfully withstood attempts to refute them. This does not mean, however, that they will not be rejected when any facts that falsify them occur. The above mentioned methodological types of sciences have been distinguished from the point of view of the position of methodological antinaturalism²⁰. Earlier, we pointed to the evaluative burdening of economic sciences.

Incidentally, it should be pointed out that some views occur in the methodology of sciences that comment the problem of values in sciences in a different way than above. The fact that a respect for values, emotions, institutions, qualitative data, experience of life, and empirical foundations of considerations are more often demonstrated in dissertations written by women is viewed as violation of the objectivistic ideal of science. Since the nineteen nineties, the mainstream of the contemporary methodology of economics have been questioned because the image shown by it is precisely like that. Some authors postulate that women scholars' investigations should be aimed at more fundamental problems of epistemology²¹.

It cannot be ruled out and, on the contrary, it is quite possible that a *post factum* analysis of scientific creations of scholars has demonstrated some selection and the manner formulating problems precisely from that point of view. If the reason for burdening the science of economics with values, as exemplified by Nelson, were actually dependent on the criterion of gender, this situation could have an impact on certain research areas of the science. Such a situation should be subjected to criticism. The problem of theoretical burdening of facts provoked disputes in methodology some time ago and similarly, at present, the issue of values in science and their cognitive status urgently require a renewed discussion. The gender criterion does not provide economics with the status of *scientia*.

²⁰ As regards the scientific cognition in natural science and that in the humanities, the acceptance of the thesis of ontological naturalism and seeking the dissimilarity of the both groups of sciences in the methodological plane, see: L. Nowak: *O skrytej jedności nauk społecznych i przyrodniczych* [On the Secret Unity of Social and Natural Sciences]. "Nauka" 1998, No. 1, pp. 11-42.

²¹ J.A. Nelson: *Economic Methodology and Feminist Critique*. "Journal of Economic Methodology" 2001, Vol. 8, No. 1, pp. 93-94.

The border between the methodology of economics and the philosophy of science is blurred and thin. The philosophy of science applies to the ideal of scientific knowledge and provides a critical analysis of those ideals. Methodology applies to the methods of realisation of a certain ideal of scientific cognition.

To simplify the presentation of the dependence of methodological rules on acceptable ideals of science and avoid any misunderstanding, it is worth introducing a distinction between (1) internal methodology and (2) external methodology in the area of economics so that to emphasise the difference between the two types of activities. Considering the above division, one can say that the first methodology is articulation of economic practice and a type of auto-reflection of practitioners. Practising of the second, external methodology requires obtaining and using specialist knowledge of specific branches of philosophy, logics and mathematical analysis.

The forum where achievements of the methodology of economics are represented (in the second meaning distinguished above) is the quarterly 'The Journal of Economic Methodology'. The scope of interest of the quarterly includes such problems as: methodological analyses of contemporary economics, analyses of methodological implications of issues of development in economics, methodological works of past theoreticians of the mainstream as well as of heterodox ones, studies on philosophic foundations of economics. The quarterly editorial team organises mini-symposiums on controversial subjects of the methodology of economics. The quarterly publishes articles and essays which are a valuable contribution to the development of methodology and which have been previously delivered at conferences organised by the International Network for Economic Method. Since 2002, as many as eight such conferences were held as organised by the same international network. Let us mention only the recent three: the 6th INEM conference was held in August 2008 in Spain (Madrid), 7th conference – Mexico, July 2009 (Xalapa), 8th conference – USA, November 2010 (Birmingham, Alabama), 9th conference will be held in Finland, in September 2011 (Helsinki).

The following papers were among the most interesting ones delivered at the conference in Madrid (2008): *Methodology in action* – Roger E. Backhouse²², *The Division of Labour in Science: the Tradeoff between Specialisation and Diversity* – Rogier De Langhe²³, as well as many other works on metaphysics,

²² R.E. Backhouse: *Methodology in Action*. "Journal of Economic Methodology" 2010, Vol. 17, Iss. 1, pp. 3-15.

²³ R. Langhe De: *The Division of Labour in Science: the Tradeoff between Specialisation and Diversity*. "Journal of Economic Methodology" 2010, Vol. 17, Iss. 1, pp. 37-51.

epistemology, rationalism, or scientific realism in action. In 2009, at the INEM conference, the subjects of realism and truth in economics, rationality and intentionality were discussed. The round-table debate concerned the future of the methodology of economics and the general lecture was on the issue of scientific realism as a challenge for economics (and *vice versa*). Among the problems discussed in 2010 was the question what type of realism lies behind behavioural economics.

There two issues following from the summary review of the problems of methodology of economics as presented in the last part of this study: (1) the methodology of economics belongs to those research areas which arouse scholars' interest, (2) a point of reference in the methodology of economics is categories worked out in the philosophy of science, such as truth, realism, instrumentalism, as presented profoundly by Ernest Nagel. The book *The Structure of Science. Problems in the Logic of Scientific Explanation* is still a valuable reading for junior research workers in economics who wish to reinforce their knowledge.

The reflections contained in this paper belong to the subject methodology of economic sciences which was lectured in the years 1994-1997 at daily studies and in the years 1994-2007 at doctoral studies in University of Economics, Katowice. The subject has been removed from the academic (university) study syllabus.

References

- Ajdukiewicz K.: *Obraz świata i aparatura pojęciowa [The Image of the World and Notional Apparatus]*. In: Idem: *Język i poznanie [Language and Cognition]*. Vol. 1. PWN, Warsaw 1960.
- Backhouse R.E.: *Methodology in Action*. "Journal of Economic Methodology" 2010, Vol. 17, Iss. 1.
- Blaug M.: *Metodologia ekonomii. [The Methodology of Economics Or How Economics Explain]*. London 1980]. Translation: Bogusław Czarny in collaboration with Alina Molisak. Wydawnictwo Naukowe PWN. Warsaw 1995.
- Duhem P.: *The Aim and Structure of Physical Theory*. Princeton University Press, Princeton 1954.
- Grobler A.: *Metodologia nauk [The Methodology of Sciences]*. Wydawnictwo AUREUS, Wydawnictwo ZNAK, Kraków 2006.
- Kersting W.: *The Equality of Chances and Self-Fulfilment*. In: *Etyka życia publicznego [The Ethics of Public Life]*. Eds. K.M. Cern, P.W. Juchacz, E. Nowak. Series: CO-OPERA – VOL. VII. The Adam Mickiewicz University in Poznań. Wydawnictwo Naukowe Instytutu Filozofii, Poznań 2009.

- Krajewski W.: *The Principle of Correspondence and the Growth of Knowledge*. Reidel, Dordrecht – Boston 1977.
- Kuhn T.S.: *The Structure of Scientific Revolutions*. Fundacja Alatheia, Warsaw 1970.
- Langhe De R.: *The Division of Labour in Science: the Tradeoff between Specialisation and Diversity*. "Journal of Economic Methodology" 2010, Vol. 17, Iss. 1.
- Musiał G.: *Współczesna metodologia nauk ekonomicznych. Perspektywy rozwoju* [Contemporary Methodology of Economic Sciences. Development Prospects]. In: *Ekonomia jako obszar badań naukowych – trendy, perspektywy rozwoju* [Economics as an Area of Scientific Researches – Trends, Development Prospects]. Ed. B. Kos. University of Economics, Katowice 2010.
- Nagel E.: *Struktura nauki. Zagadnienia logiki wyjaśnień naukowych*. Tłumaczenie zbiorowe: J. Giedymin, B. Rassalski, H. Eilstein. PWN, Warszawa 1970.
- Nelson J.A.: *Economic Methodology and Feminist Critique*. "Journal of Economic Methodology" 2001, Vol. 8, No. 1.
- Nowak L.: *O skrytej jedności nauk społecznych i przyrodniczych*. [On the Secret Unity of Social and Natural Sciences]. "Nauka" 1998, No. 1.
- Nowak L.: *Prawo nauki, teoria, determinizm. O „Strukturze nauki” Ernesta Nagla*. [The Law of Science, Theory, Determinism. On Ernest Nagel's "The Structure of Science"]. "Człowiek i Światopogląd" 1972, No. 2.
- Nowak L.: *The Law of Science, Theory, Determinism. On Ernest Nagel's. "The Structure of Science"*. In: *Idealization and Concretization*. Ed. T.A.F. Kuipers. University Press, Groningen 1980.
- Nowakowa I.: *The Idea of „Truth as a Process”. An Explication*. In: *Idealization III: Aproximation and truth*. Eds. J. Brzeziński, L. Nowak. "Poznań Studies in the Philosophy of the Sciences and the Humanities" 1992, Vol. 25. Adam Mickiewicz University, Amsterdam – Atlanta, GA.
- Suppers P.: *Ernest Nagel 1901-1985. A Biographical Memoir*. National Academy of Science, Washington D.C 1994.
- The Handbook of Economic Methodology*. Eds. J.B. Davis, D. Wade Hands, U. Mäki. Edward Elgar Publishing. Cheltenham, UK, Northampton, MA, USA 1998.
- Woleński J.: *Epistemologia*. Vol. III. *Prawda i realizm*. Aureus, Kraków 2003.
- Zamiara K.: *Metodologiczne znaczenie sporu o status poznawczy teorii. Z problemów związków między metodologią nauk i teorią poznania*. PWN, Warszawa 1974.
- Zeidler P.: *Spór o status poznawczy teorii. W obronie antyrealistycznego wizerunku nauki*. Wydawnictwo Naukowe Instytutu Filozofii. Tom IX, Adam Mickiewicz University, Poznań 1993.