

SOME ASPECTS OF SCIENTIFIC HABITUS (CASE STUDY OF STATE SCIENTIFIC SCHOOLS OF BELARUS)

Marya Dzisko-Schumann¹

Abstract

In the paper I propose the hierarchical model of scientific consensus, when the following conditions should take place: (1) the logical correctness of scientific theory; (2) scientific theory should conform to the values of appropriate informal scientific association (scientific school); (3) scientific theory may be accepted in the future within scientific habitus (i.e. it can be interiorized into social activities of scientists). Scientific habitus is a social context of any scientific research. To exemplify this notion I consider some features of scientific habitus in Belarus.

Keywords: hierarchical model of scientific consensus, administrative market, scientific habitus

Introduction

The philosophical analysis of social factors of scientific trends is very important now for defining innovation policy. These factors stipulate pragmatic conditions in appearing scientific consensus in different sciences.

Let us notice that since the ‘historical school’ in science philosophy the interest has been displaced from the area of the logic of scientific knowledge into the area of the history of its development. It has caused a failure of classical style of thinking and cumulative model of knowledge development. The claim that the science history has no linear direction, i.e. that it is not progress, became the basic statement of philosophers of ‘new wave’. So, exemplifying by concrete historical facts can show that the science development has more the form of salutatory evolution. Non-cumulative transition in scientific knowledge means a radical change of the reflective basis of co-operative activity of scientists, in Thomas Kuhn’s words: the shift of scientific paradigms, i.e. ‘scientific revolution’ (the stage of intensive development of knowledge) when the stage of ‘normal science’ (the stage of extensive development of knowledge) is finished.

Let us ask now the following questions. What allows us to find a scientific consensus in time of scientific crisis? Or, otherwise, what is decisive argument for accepting a new theory?

¹ Dr Marya Dzisko-Schumann, Wyższa Szkoła Informatyki i Zarządzania z siedzibą w Rzeszowie, Ul. Sucharskiego 2, 35-225 Rzeszów, mdzisko@wsiz.rzeszow.pl.

Hierarchical model of scientific consensus and the notion of scientific habitus

In Leibniz's ideal of substantiation as well as in neo-positivist methodology of science it is claimed that factual propositions (descriptive statements) cannot be used as thesis of scientific argumentation, because in respect to them there cannot be disagreements during scientific discussions. The justification of the given ideal was determined by specific understanding of what the intelligent agent is. According to this ideal, the intelligent agent with cognitive abilities is a kind of automata for formal-logical processing of empirical data. Possible divergences in relation to factual propositions were treated as mechanical errors which can be easily deleted by means of certain checking procedures. Thus, they sum up that disagreements among scientists can be initiated by the occurrence of new theories, concepts, theoretical schemes or assertions, etc., which originally have a hypothetical kind and are subject to discussion and further substantiation.

However, we can face situations when procedures of logical substantiation become insufficient for making final decisions about a choice of this or that point of view. For example, when both theories appear equally confirmed by means of empirical arguments accessible at a given stage of science development. In this case, for the overcoming of the existing disagreements and the consensus of scientific community in respect to the choice of one of the points of view, it is necessary to collect new more differentiated data which would act in a role of arguments, already sufficient for confirmation or, on the contrary, for disproof of one of the considered items.

Representatives of post-analytic philosophy pay our attention that the classical (Leibniz) model of substantiation is a sufficient tool for explanation only until we examine arguments occurring within the limits of one theory, one paradigm or one research program. When we deal with qualitative transitions from one level of development of scientific knowledge onto another (for example, the situation of Copernican revolution), explanatory tools of neo-positivist model become obviously insufficient. From here it follows that in situations of scientific revolutions for explaining the mechanism of scientific argumentation it is necessary to use a *hierarchical model of consensus*. According to this model, a scientific theory should be not only logically correct, but also it should satisfy a hierarchy of values which is shared by overwhelming majority of scientists.

So, a scientific consensus from the standpoint of hierarchical model is reached if and only if there is an acceptance of scientific theory on the basis of the following parameters: (1) the logical correctness; (2) on the basis of its conformity to the key values of appropriate informal scientific association (in particular, to basic ideas of scientific school); (3) on the basis of the principal possibility of its future acceptance within *scientific habitus*, i.e. due to the possibility to interiorize results of this theory into social activities of other scientists in the future (when these results will become an integral part of any scientific investigations in the given area). We can show that the first level of consensus means the logical level of argumentation, the second the dialectical level, and, at last, the third the rhetorical level.

The highest level of recognition of scientific theory is its acceptance on the level of *scientific habitus*, entailed an interiorization of results of research activity into social practice of scientific community as a whole. Only in this case a scientific theory may enter into the general scientific thesaurus. For instance, among physical theories conventionally interiorized into the scientific habitus of physicists we can refer to the following: Copernican heliocentric system, Newtonian mechanics, Maxwell's electrodynamics etc. Now it is impossible to be the physicist and not to know all these theories. Furthermore any scientists in humanities or social sciences will not contest now, say, the Copernican heliocentric system and in spite of the fact

that they cannot prove it. If a theory enters into scientific habitus, i.e. it is accepted by the whole scientific community, it acquires thereby the higher objectivization in scientists' eyes.

The hierarchical model of consensus can be used as well in situations of 'normal science' in Kuhn's words when the scientific knowledge is accumulated gradually and there are no scientific revolutions. For confirming this claim we will provide *a modelling example of studies in cumulative growth of knowledge*. As such an example we will consider the history of Yuri Matiyasevich's proof of the Hilbert's tenth problem. This brilliant mathematician carried out his research within the pragmatic limits of the basic ideas and approaches of Andrei Markov's school of constructive mathematics. Let us remind that in the Russian mathematical science since Soviet times there are two schools of constructive mathematics till now: the school of constructive analysis and constructive logic, founded by the corresponding member of the Russian Academy of Sciences, Andrei Markov (†1984), and the school of algebra and logic, founded by the member of the Russian Academy of Sciences, Yuri Ershov. Representatives of these schools have cool enough and weak professional contacts between themselves.

Usually, an establishment of scientific school is considered connected with special endowments of its founder, his ability to be attractive for followers and young scientists. Such a point of view does not concern circumstances that for creating a scientific school besides the research talent and strongly pronounced skill to communicate, a scientist should have also an administrative resource, i.e. an initial *carte blanche*, opening a wide spectrum of possibilities for scientific activity. This *carte blanche* is always granted by a 'customer' (on behalf of influential social group) as original advance payment. After all any serious research activity is always the long-term project can be without appreciable results in the foreseeable future. So, Andrei Markov was born to the family of the very known Russian mathematician, the member of the Imperial San-Petersburg Academy of Sciences, and his scientific career developed at once easily enough.

After Matiyasevich received all necessary theorems for the proof of his result, caused his world popularity among mathematicians, the leaders of Markov's school helped him to contact Julia Robinson, organised a meeting, and agreed about the possibility to publish their joint papers, e.g. their second joint article was published in *Acta Arithmetica* very soon. As a result, within two-three years Matiyasevich became the mathematician with the world name.

Thus, the joint publications of Robinson and Matiyasevich were thought as a strategic step which played the positive role not only in Matiyasevich's destiny, but also they were useful to Markov's school at all (it led to the obvious strengthening of its international positions).

As we see by the example of Markov's school and Matiyasevich's proof, any creation of scientific schools with a recognised brand is a complex strategic problem. It is not enough to carry out a successful research, it is necessary to enter it into scientific habitus. For this purpose, it is necessary not only to have a support in the own country, but also to possess an ability to communicate with the famous western scientists.

Administrative markets in Belarus as social context of scientific habitus

In Belarus almost all scientific schools were created during the Soviet period, for example, the Belarusian school of algebra, of quantum mechanics, of theory of image recognition, etc. These schools had the importance within the limits of the Soviet science. Now the given schools lose the positions. It is connected to that in the Post-Socialist countries including the Post-Soviet ones there is recently an orientation to the western centres of science. The former Soviet scientific centres became a scientific periphery. In other words, it

is possible to state that scientific habitus, characteristic for Eastern Europe, was changed. However, the given circumstance is still realised by a very few people among scientists of the senior generation. In the conditions of changed habitus the scientific results have been accepted in the different way as it was earlier.

If to apply the methodology of 'historical school' to explicating a social and economic context of the Belarusian science, it is possible to notice that the Belarusian science exists under the conditions of *administrative markets*. The features of this market consist in that its exchange relations include as well values and institutes which, as a rule, cannot be used in the form of the goods in any normal capitalist market.

Market economic activities are not hierarchical, its relations are mainly horizontal. Known market hierarchical institutes, such as stock exchanges and banks, are entered into non-hierarchical relations and cannot exist outside of market laws. Buyers and sellers in market are equal, and money is a measure of all things. The quantity of money, an agent of market has, is a measure of his importance in economy. Unlike market activity, political activity is hierarchical and defined by aprioristic values, purposes and means for their achievement. Political activity hierarchizes people included in it, gives them authorities. The political status is a capital of politician which he uses for achievement of his purposes. And purposes, as a rule, consist in the aspiration to increase political weight (status) or, at least, to preserve it, since just having political weight allows a politician to reach his purposes (Kordonsky 2006).

Hence, the *administrative market*, unlike the normal capitalist one, is hierarchical, though it contains also horizontal relations of exchange which are called *logrolling*. An elementary example of logrolling is reflected in the following principle of survival, known to any successful officer: 'you endorse my documents by signature, and I endorse your documents by signature'. In a word, logrolling is a motto: 'you give something me from your administrative sources, I give something you from my sources'. In Eastern European region, the administrative market appeared for the first time during Brezhnev's epoch: "This economy was generated after Stalin and was our great gain whose positive result was that the country was prepared for exchange relations before Gaydar comes with his reforms. It is possible to say that the Brezhnev's epoch is an epoch of trade" (Nayshul 2004).

The typical scheme of management of economy during Brezhnev's epoch looked as follows. The enterprises asked for resources. These requirements were summarised, being lifted upwards by administrative ladder, until they reached the government body, whose competence was to give tasks to manufacturers. Then these tasks were distributed between manufacturers which presented the own requirements in return to deliveries of input resources so that the planning cycle repeated again and again. Planning began not 'from above' as in the Stalin command system, but 'from below' and carried not a directive, and coordinating and iterative, repeating character. (...) The system of the vertical auctions was supplemented by illegal, legalized or legal horizontal auctions, i.e. by exchanges between organisations. (...) Such exchanges were not and are not a corruption (in sense of crime), but a complex system of universal administrative market where all is purchased and sold (Nayshul 1992).

The command-administrative system of the Soviet Union was smoothly transformed into the administrative markets. These markets have played then a main role in transformations of Post-Soviet societies: in privatisation, in the so-called market reforms etc.

Now these markets form key rules of game in economy of not only Belarus, but also Ukraine and Russia.

One of the firsts, Ludwig von Mises assumed an impossibility of pure planned economy, having paid attention of that the officialdom begins to execute any functions of market itself. Indeed, under conditions of phaseout of goods markets there will be their substitutes, in particular administrative markets.

In the Soviet Union administrative markets have been studied for the first time within two research groups: Moscow (one of its leaders was Vitaly Nayshul) which studied the State Planning Committee, and Novosibirsk (one of its leaders was Simon Kordonsky), studying the rural district of Altay territory.

Now the theory of administrative markets is well studied, there are mathematical models which describe these markets. In Russia the theory of administrative markets is used even in country government. In Belarus the local administrative markets are studied badly and their analysis is not used anywhere.

The specificity of Belarusian administrative markets is that they are too hierarchical, therefore competitiveness is too hard and always there is possibility to be sentenced for usual logrolling.

Administrative markets hold if there is no normal capitalist market. Their feature is that they are parasites for economy, slowly undermine it. They are built on over a real sector of economic activities like a financial pyramid and sooner or later they can be destroyed. Therefore any administrative market has a life-cycle: birth, expanding, and death.

The Belarusian science exists within local administrative markets. It is connected to facts that science and education are considered as state institutes, therefore their management is centralised. The Belarusian science represents a kind of administrative market included into the general administrative markets of this country. In such conditions in the Belarusian science there is logrolling which makes science very inert and not inclined to innovations.

Nevertheless, such a system has some advantages connected with the possibility of centralised reforming of the system of higher education.

Some features of scientific habitus in Belarus

Thus, we can emphasize the following social factors of the Belarusian science:

1. Belarusian scientific habitus preserves the Soviet features and it badly belongs to the world scientific habitus; the characteristics of Belarusian habitus are as follows: conservatism, non-propensity to innovations, passivity, expectation of instructions from above.
2. The Belarusian scientific habitus supports scientific administrative markets, whose relations are constructed on the basis of logrolling. Administrative markets in science define an isolation of the Belarusian scientific communities.
3. The true dynamics of the Belarusian science is defined by relations in administrative markets, therefore it is not transparent and clear by superficial sociological analysis. Administrative markets cannot be revealed by usual statistic analysis for example.

These social factors are basic obstacles for realisation of innovative scientific policy.

The Belarusian science requires a number of transformations: the scale integration into the international scientific infrastructure, integration of education system and research centres, the creation of new corporate culture, the effectivization of existing models of communications, including the branding and PR of the Belarusian science. Within Leibniz's

ideal of substantiation as well as neo-positivist methodology of science there cannot have been defined such problems.

In the innovative policy of Belarus, social technologies are not considered as a source of innovations. It is a restriction of the concept of innovations when innovations only concern the production commercial specification. Nevertheless, social technologies can supply a more effective organisation of activity and better promote productivity.

The analysis of statistical data in Belarus, concerning developments of science and production, allows us to draw a conclusion that there is no essential shift in innovations for the last five-years period. We can assume that it is connected to that social technologies, according to which the Belarusian science exist, remain outside of prospective reforms. Communicative models, which we can study within the theory of scientific argumentation, can show weaknesses of social technologies of the Belarusian science so that we will know what is necessary to reform in the sphere of scientific communications. For example, now only the Russian vector of world integration of the Belarusian science is presented, while the western vector is not.

References

Perelman, Ch., Olbrechts-Tyteca, L. (1971). *The New Rhetoric. A Treatise on Argumentation*. Translated by J. Wilkinson and P. Weaver. Notre Dame: University of Notre Dame Press.

Антонова, Т.А. (2012). Научные кадры Республики Беларусь: гендерный анализ по итогам 2010г. *Веснік Гродзенскага дзяржаўнага ўніверсітэта імя Янкі Купалы. Эканоміка. Сацыялогія. Біялогія*. 2(131).

Артюхин, М.И. (2011). Элитные группы в науке: проблемы идентификации и типологии. *Наука и инновации*, №1. С.50-53.

Государственная программа инновационного развития Республики Беларусь на 2007–2010 годы. Минск: ГУ «БелИСА», 2008.

Государственный комитет по науке и технологиям Республики Беларусь, Национальная академия наук Беларуси. Аналитический доклад. *О состоянии и перспективах развития науки в Республике Беларусь по итогам 2010 года и за период 2006–2010 годов*. Минск: ГУ «БелИСА», 2011.

Государственный комитет по науке и технологиям Республики Беларусь. *Отчет о ходе выполнения Плана реализации Государственной программы инновационного развития Республики Беларусь на 2007–2010 годы в 2010 году*. Минск, 2011.

Европейская экономическая комиссия, Организации Объединенных Наций. *Обзор инновационного развития Республики Беларусь*. Нью-Йорк и Женева, 2011.

Концепция Государственной программы инновационного развития Республики Беларусь на 2011–2015 годы. Минск: ГУ «БелИСА», 2011.

Кордонский, С. Г. (2006). *Рынки власти: Административные рынки СССР и России*. М.: ОГИ.

Мееровская, О.А., Т.О. Ляднова. О некоторых актуальных тенденциях в развитии международного научно-технического сотрудничества Республики Беларусь. http://belisa.org.by/ru/izd/stnewsmag/1_2008/art4_7_2008.html

Найшуль, В. (1992). Либерализм, обычные права и экономические реформы. *Мировая экономика и международные отношения*. № 7.

Найшуль, В. (2004). Публичная лекция для Полит.ру, апрель 2004 г. <http://polit.ru/article/2004/04/21/vaucher/>

Народное хозяйство БССР в 1988 г. Минск, 1989.

Наука и инновационная деятельность в Республике Беларусь. Минск: БелИСА, 2011.

Наука и инновационная деятельность в Республике Беларусь: Статистический сборник. Минск: БелИСА, 2012.

Наука Республики Беларусь 1995: Статистический сборник. Минск: БелИСА, 1996.

Наука Республики Беларусь 2000: Статистический сборник. Минск: БелИСА, 2001.

Наука Республики Беларусь 2001: Статистический сборник. Минск: БелИСА, 2002.

Наука, инновации и технологии в Республике Беларусь 2004: Статистический сборник. Минск: БелИСА, 2005.

Наука, инновации и технологии в Республике Беларусь 2005: Стат. Сб. Минск: БелИСА, 2006.

Наука, инновации и технологии в Республике Беларусь 2006: Статистический сборник. Минск: БелИСА, 2007.

Научные кадры Республики Беларусь: Социологический анализ. Минск, 2007.

Научный потенциал Республики. Минск, 1991.

О выполнении научных исследований и разработок в 2010г. Минск, 2011.

Постановление Совета министров Республики Беларусь. 26 мая 2011 г. № 669 О Государственной программе инновационного развития Республики Беларусь на 2011–2015 годы.

Цыпарков, В.Л., Гурина, Е.В., Енин, Ю.И. (1981). *Научный потенциал высшей школы БССР.* Минск.