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## KAZIMIERZ MARCINIAK'S VIEWS ON SCIENCE TASKS

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### ABSTRACT

*This article is devoted to the person and his views on the role of scientific activity in the life of the university and its significance for the social life. Kazimierz Marciniak represented geography and he specialized in climatology and bioclimatology. His extensive academic experience, gained through studies and scientific work at several Polish universities and in the Institute of Balneology in Poznań, made him not only an excellent researcher, but also a scholar whose views on the role of science in the life of the university and in social life were influencing the generation of representatives of many sciences who worked at the WSG University in Bydgoszcz. The convictions of the scholar in question, his broad vision of science not only as an enterprise calculated on commercial values, place him among the outstanding Polish scientists and philosophers. He shared with them not only the conviction about the cognitive function of science, which was engaged in economic activity, but also noticed its highly humanistic and ennobling role in relation to the researcher, in which the creative aspects of his work are present. Scientific work also contributes to the improvement of the educational process. Participation of a student, in any form of scientific activity, shapes his intellectual and even moral skills, educates in the spirit of the culture of the word, especially the written one. In the opinion of the discussed author, the main function of science for the entire social life is to forecast phenomena. Exploratory and exploratory functions are important, however, they are subordinated to the former. His methodological and philosophical views on the structure and dynamics of scientific theories were characterised by inductivism and probabilism. Some of his views on the questions of the nature of phenomena, the structure of reality and the relation between scientific theory and reality, were not presented in an unambiguous way; it also seems that they evolved towards anti-phenomenalism, anti-foundationalism and essentialism, which distanced him from scientism, as a worldview quite characteristic of representatives of the natural sciences of the 20th century.*

**Keywords:** *scientific research; higher education institution; educational function of science; prognostic function of science; inductivism; scientism.*

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## INTRODUCTION

Kazimierz Marciniak, whose views are the subject of this article, was a scientist and a scholar, representing geography and specializing in climatology and bioclimatology, an academic teacher, but first of all the Rector and the Rector's Deputy for Education of the WSG University in Bydgoszcz. Due to the latter two functions which he held at the University, he was able not only to present his convictions concerning science, its role in higher education and in social life, but above all to assess to what extent they contribute to the intensification of scientific activity. The Professor left a permanent mark of his presence at the WSG University, not so much through permanent solutions in the area of infrastructure, but rather in the form of a specific set of ideas and convictions concerning the scientific dimension of the school's activities. The views expressed in the form of publications or verbal communication involved the academic community thus contributing both to the integration of scientific staff around certain main ideas, as well as providing justification for choosing specific directions of its development. Moreover, they provided practical guidance on how to implement specific goals arising from the University's mission. This mainly concerns opinions on improving the educational process and increasing the organisational efficiency of scientific activities (Marciniak, 2000, p. 7). At this point it is worth noting that a special place in this respect was occupied by the so-called academic imponderabilia, i.e. norms, values, symbols and academic traditions, etc., which in the literature related to management are regarded as elements of organisational culture. The author in question attached great significance to them, as they created an appropriate atmosphere for scientific activity, served the purpose of openness and the ability to listen to others, and cemented research teams (Marciniak, 2000, p. 19).

## PROBLEM STATEMENT

The Professor's views became an important part of the collective awareness of the University's internal stakeholders, which affected the rapid adaptation of the University to the changing legal conditions for the functioning of higher education institutions in Poland and the progress of civilisation, which necessitated greater involvement of academic communities in the life of local communities. Thus, it is worth recalling and assessing some of the views, among others, in the context of the implementation of the reform of the higher education system in Poland, whose legal basis is the Act — Law on Higher Education of 20 July 2018, known as the 'Constitution for Science'. Apparently

the views of the author in question on science and its significance in the life of a higher education institution and in the life of society consolidate the approach contained in the aforementioned Act.

The views related to Professor Marciniak's research and scientific work were the result of his own scientific activity, including scientific expeditions to Spitzbergen, work at a scientific institute, i.e. the Balneological Institute in Poznań, and then at universities as an academic teacher (Marciniak, 2001, p. 12). Such undertakings not only served the purpose of acquiring empirical research material, but also contributed to the improvement of his own research technique. The several-month visits provided an opportunity for personal reflection on the conducted research and enabled discussions on issues related to this activity and science as such. Due to the scientific expeditions, there was a chance to confront his own views on scientific work with the views of other researchers, including those from other countries. All that taken together, i.e. his studies, Marciniak's own research work, international research experience, the high culture of scientific work at three Polish universities (the Adam Mickiewicz University, the University of Gdańsk and the University of Łódź), as well as the scientific work carried out at three colleges (the Nicolaus Copernicus University, the Kazimierz Wielki University and the WSG University), provided a comprehensive picture of what scientific work is and what it should be. Particular significance should be attributed here to the Rector's function, which required from him not only direct participation in scientific life, but above all activities of an organisational nature, issuing orders and other internal acts of law important for regulating scientific activity and forming, aptly called, the appropriate climate (organisational culture), which would favour scientific activity at the University.

The purpose of this article is to present and analyze the views of prof. Kazimierz Marciniak on the role of scientific activity, including research and scientific creativity, on the entire academic life, and in particular on the organization of the university, the implementation of educational tasks, including the development of intellectual skills, which are necessary both in research and professional work outside the university.

## **BACKGROUND**

The analysis of the author's views on the above issues is justified as much as he was a complete scientist, i.e. he had significant scientific achievements in the field of the represented scientific discipline, he had extremely extensive knowledge in the field of university didactics and extensive experience in this field, he had well-established views on the topic of the praxeological dimension of the functioning of universities, i.e. effective management of research and educational processes. A deep humanistic dimension, extensive teaching experience and extraordinary organizational talent are the best recommendation for the presentation and analysis of his views on the above-outlined topic.

## SOURCE MATERIAL

The presentation of Professor Marciniak's views on issues related to science and higher education is a kind of reconstruction. The professor did not leave behind any scientific texts relating directly to the subject matter of this article. It is difficult to ascribe to him the authorship of any concept of the legitimacy of science or, even more, having an original philosophy of science. There is no doubt, however, that he held certain views on what science is, how it has changed over time, what is its social significance, what is its role in the organisation of higher education, in shaping the minds of students, etc. He addressed the above issues in his different speeches, more or less officially, but he did so rather occasionally and spontaneously, usually during the inauguration of the academic year, jubilee celebrations of the University, meetings of the University's bodies. He referred to these topics during discussions held at meetings organised by institutions representing vocational and/or non-public universities, accompanied by state authorities. He held disputes with the author of this article during private conversations related to the subject of the tasks of the University, especially the implementation of teaching tasks and their connection with science. This does not mean, however, that he did not publish his views on science and its functions. A number of issues concerning his scientific activities can be found in materials of a journalistic nature, e.g. in interviews which were published in the university's quarterly magazine "Kurier Uczelniany". The source material constituting the basis for the article should be divided into four groups:

- 1) works of a reporting or chronicling nature, presenting the scientific and teaching activities of the organisational units in which the professor worked as a research and teaching employee,
- 2) occasional papers, prepared to commemorate the jubilee of scientific work of his masters, colleagues and co-workers, which he undertook — and this should be particularly emphasised — always with the greatest pleasure,
- 3) works of a popular science nature, printed in the university and community continuous publications, some in the form of interviews,
- 4) geography textbooks or chapters in geography textbooks on climate.

However, not all of the views of the author on science and higher education have been documented in the form of a scientific publication or even in writing. Some were presented in oral interpretation. Taking the above into account, it can be concluded that the overall source material for the study of the subject under consideration should be divided into five categories:

- 1) the above-mentioned types of works, which are relatively easy to access, as they were written in the later period of scientific and teaching work of the author in question and were published in journals or publications that reached a wider audience,

- 2) works offered to Professor Marciniak on the occasion of his 70th birthday jubilee, including articles discussing and documenting his scientific, teaching and organisational achievements,
- 3) university documents, in the form of studies, elaborations or other official documents, remaining in the University archives, the creation of which was influenced by Professor Marciniak's views on science and didactics of higher education,
- 4) unpublished and unedited notes, collected in notebooks kept by Professor Marciniak, covering almost the entire period of his employment at the WSG University, i.e. from 2000 to 2015 inclusive,
- 5) verbal testimonies obtained by the author of this text from Professor Marciniak, due to 15 years of close cooperation with him at the WSG University.

Finally, it should be said that the adopted research methodology refers to the philological analysis and the biographical analysis of the documents mentioned above. In a sense, the methods used here refer to the research traditions of Florian Znaniecki<sup>1</sup>, who applied them in the field of sociology, and not as usual in historical or cultural studies. The methods used allow the author of this text to go beyond the so-called research intuition and interpretation, more or less referring to the principles of the hermeneutic method.

This article, although based on mainly written sources supplemented by oral testimony, is not a scientific biography and does not provide a basis for a complete description of the Professor's profile as an academic teacher, scientist or scholar. The bibliography of his scientific works includes around 250 items. It is not even sufficient to assess the contribution he made to the development of research at the WSG University in Bydgoszcz. In a sense, the work published in 2015 on the occasion of the jubilee of the establishment of the University, entitled *WSG University. 25 years of implementation of the idea of the university of entrepreneurship*, under his editorship, which is a record of 15 years of the history of the WSG University, as well as the preceding 10 years of experience and preparations for the establishment of the University, gives a more complete picture of Marciniak's achievements.

## KAZIMIERZ MARCINIAK AS A SCIENTIST

The description of Professor Marciniak's views on science should started by recalling his scientific and research interests. The discussed author graduated from the faculty of geography and obtained a scientific degree in geography,

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<sup>1</sup> Florian Wiktor Znaniecki (1882-1958) — Polish philosopher and sociologist, founder of the Polish school of sociology. co-creator of the so-called biographical method in sociology, a representative of the humanistic sociology that he created in the USA, where he lived and worked from 1939 until his death. It is worth noting that Znaniecki was for many years a professor at the University of Poznań, where Kazimierz Marciniak studied.

and his scientific speciality was climatology. This places Professor Marciniak among the representatives of:

- a) theoretical sciences, ideographic in nature<sup>2</sup>,
- b) natural sciences, as climatology deals with nature<sup>3</sup>,
- c) empirical sciences, as the research process is based on collected empirical data.

At the same time, as a climatologist, he was familiar not only with physical geography, but also with social and economic geography in its different forms, e.g. the geography of tourism, as well as with humanistic geography. The scientific discipline represented by him (geography) can be regarded as methodologically peculiar. It uses two research paradigms, which can be called respectively:

- 1) naturalistic, as it arises from the positivist spirit and is specific to the natural sciences, and
- 2) interpretative, as it arises from hermeneutic historicism, specific to the humanities.

The Professor's scientific interests evolved from his initial interest in climatology and partly also in meteorology, through bioclimatology to health tourism, which shows that the focus of his interest shifted from theoretical issues towards the applicability of the results of science in social practice, mainly related to health and the use of natural resources for health purposes. He was interested in health prevention, rehabilitation and spa treatment. Due to this, he had to extend his original interest in the climate, i.e. nature, to the man himself, considered not only in his physical dimension, but also in his psychological and spiritual dimension. The last several years of Professor Marciniak's scientific work were connected with tourism, especially health tourism and spa tourism. His first publication already, from 1971, entitled *Sightseeing near and far*, as well as organizing sightseeing trips for school children when he worked as a teacher in schools, confirm that tourism was an important area of his interest for practical reasons, and later became an area of scientific interest. This episode of several years in the field of his scientific and research interests related to tourism also opened him up to the area of social phenomena, and combined with his knowledge of the man as a bodily-spiritual being, to an anti-naturalistic research paradigm.

Discussing Professor Marciniak's views on science, it must be admitted that his extensive research interests and orientation towards tourism led him to become interested in research conducted in multidisciplinary teams. Although he never abandoned his interest in monodisciplinary research, as he always perceived himself to be a geographer and climatologist, he noticed a great role of multi- or interdisciplinary research. It is also impossible to ignore

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<sup>2</sup> The distinction between ideographic (descriptive) and nomothetic (law-forming) sciences in contemporary scientific methodology and philosophy of science is being questioned, due to discrepancies and ambiguities about what scientific law is.

<sup>3</sup> Nowadays it is believed that the climate, and more precisely its changes are influenced not only by natural but also anthropogenic factors.

the fact that he repeatedly formed research teams and led the teams many times<sup>4</sup>. He twice led expeditions to the Arctic, where teams from the Institute of Geography of the Nicolaus Copernicus University conducted climatological and glaciological research using the research station established there. He was, however, a representative of the old research school, which strove for scientific generalisations through inductive reasoning rather than making bold hypotheses and verifying them with research data.

His extensive scientific interests, exceeding the framework of disciplines or even fields of science, made Professor Marciniak a generalist rather than a specialist, which was conducive to addressing issues of significant importance for the life of local communities. He was interested in the issues related to the development of the metropolitan area of Bydgoszcz and Toruń, especially the development of health tourism in the Kuyavian-Pomeranian Voivodship, the development of public transport, the use of natural resources, alternative sources of energy such as wind, geothermal waters, etc. He freely discussed issues beyond his purely scientific interests. He was particularly interested and opened towards the development of information technology, as well as the computerisation of different areas of life. He was very impressed by the dynamics of the development of this discipline of science, as well as by the scope of its practical applications in all areas of life, including science.

## **THE ROLE OF SCIENCE IN HIGHER EDUCATION INSTITUTIONS**

Nowadays, higher education and science are sectors with a high impact on the whole of economic life. Economic and social innovation are significantly dependent on contemporary science, and the labour market is looking for people with modern and versatile competencies, which only university graduates possess. Science gives birth to scientific discoveries that contribute to the emergence of groundbreaking economic and social innovations. Due to cooperation between science and business, people of science get involved in solving problems of the socio-economic environment, which in turn fosters innovation. The growing expectations of the economy and, importantly, of the state's social policy towards higher education perceive higher education as a factor which will contribute to balancing the labour market through the inflow of appropriately educated staff to build a knowledge-based economy.

Undoubtedly, Professor Marciniak's views were shaped by his experience gained at classical universities, i.e. modelled on the concept (model) of Wilhelm von Humboldt. He was certainly familiar with other models, e.g. the model of the elite university (the so-called Oxbridge model) or the French model

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<sup>4</sup> The author personally took part in four expeditions to Spitsbergen, conducting research on the Arctic climate. During the expedition in 1978, he was one of the initiators of biometeorological and topoclimatic research in the area of the Waldemar Glacier.

(e.g. *grandes écoles*) of highly specialised universities, partly implemented in Poland in the form of, for example, medical or agricultural academies. The former model treated scientific research as the foundation and main task of a university, and the educational process took place in conjunction with the scientific research of the university staff. In a word, the strength and position of a university lies in the strength and position of the scientific achievements of its staff. Particular significance should be attributed to the model of the so-called university of entrepreneurship, also called the third generation university. The latter, in spite of the fact that it basically only supplemented the classical model with broadly understood academic entrepreneurship, in fact led to a different profiling of the place of science and scientific activity at the university. In the opinion of the discussed author under, these activities were integrally connected with higher education, regardless of whether it was of a university, academic or so-called vocational nature. «Academisation» was one of the key terms frequently used by Professor Marciniak, which had a number of various contents, but the most important one concerned the need for scientific activity, which in general is a distinctive feature of a university among the whole spectrum of education, including schools belonging to the sector called, according to the Polish tradition, «education». The statements of the author were formed through the prism of natural research, which does not mean that he was not familiar with the most important achievements and peculiarities of the methodology of other sciences, especially social and legal ones.

Higher education institutions are increasingly required to provide up-to-date knowledge, preferably of a practical nature, and to develop unique skills which will provide staff for the most developing sectors such as IT, telecommunications, robotics, biotechnology etc. The vision of science being absorbed by technology and the increasingly visible symptoms of the formation of a conglomerate called technoscience was probably not the dream of the author in question. Apparently in his opinion, it destroys the autonomy of science, makes science dependent on technology, limits it and, in a way, distorts it. The emergence of technoscience will consequently lead science beyond the walls of the university, to international corporations.

Although the Professor was not a supporter of the classical view that a scientist seeks scientific knowledge for its own sake, i.e. knowledge for knowledge's sake, as the Latin maxim *scire propter scire* states, he perceived the subjective dimension of scientific work, which not only serves to form and enhance research skills, but also to form intellectual and moral skills that ennoble a person as a human being. Therefore, science practised within the walls of a university, considered from the subjective point of view, constitutes an educational tool. Students learning to carry out scientific research, getting to know the so-called 'scientist's kitchen', through imitation acquire not only research skills, but also attitudes typical for scientists, which are also characteristic for an enlightened and cultured man. It may seem slightly strange, but in the end, practising science in a university has a deeply rooted humanistic dimension. This aspect of scientific

activity is indicated by Stanisław Kamiński in his important, from the point of view of the philosophy and history of science, work «The concept of science and the classification of sciences». He points out that the inclination to carry out scientific research is, in a way, inscribed in the human genotype, and therefore, it stems not only, or at least not exclusively, from man's existential needs but also from his rational nature. The human being wants to understand the natural world and strives to understand his being, also as a being that has cognitive abilities (Kamiński, 1981, p. 210).

The human being as a researcher and creator is a phenomenon no less interesting than nature itself. The discovery not only blunted the clinging to facts, but opened the author to the peculiar artefact, which is a text, especially a scientific one. The spoken and written word became the area on which he focused his attention and criticism, searching for various interpretations and meanings. At the end of his life the style of scientific writing became his favourite area of interest. He was very sensitive to any mistakes in the verbal communication of ideas, meticulous and critical in his assessment of scientific creation, but also eager to help others. He believed that scientific work, like scientific inquiry, also has a humanistic dimension, which shapes young people in the culture of the word and teaches them reverence for the word, especially the written one.

## **SOCIAL SIGNIFICANCE OF SCIENCE**

Kazimierz Marciniak, as befits a natural scientist and the main trends in the practice of science in the second half of the 20th century, matured scientifically in the cult of science and in the belief in its omnipotence. Kazimierz Marciniak, as befits a natural scientist and the main tendencies in the practice of science in the second half of the 20th century, matured scientifically in the cult of science and in the belief in its omnipotence. In a sense, this belief, rooted in positivism, is a natural drive for scientific activity. This conviction that science drives social progress and is an important factor in improving the quality of life accompanied him for the rest of his life. However, he broke with the (neo)positivist belief in the omnipotence of science and its ability to solve all human problems, not only social or material and existential ones, but also cognitive ones. Nevertheless, his vision of science was rather pragmatic; he perceived it as a tool for human action. He believed that science should not only investigate the truth about the world, i.e. state and describe facts, explain and establish regularities, but also create a scientific theory (mathematical models), due to which it is possible to predict (forecast) events. Science should not only have a cognitive value, but above all, it should serve people and bring them benefits. However, the Professor was not engrossed in the passion for finding applications of the achievements of science. He did not mind the commercialization of the results of scientific research, but it was not a challenge for him, which might be expected of him in the case of holding important academic functions.

Although he acknowledged the exploratory function of science, and in particular saw in scientific theory a kind of representation of a fragment of reality, allowing for a deeper insight into phenomena and interrelations between them, he did not overestimate its significance unless it led to practical applications, e.g. creation of technologies or forecasts that would serve man. The mere explanation of facts, including the search for cause-and-effect relations or correlations, was for him an important, but not the final stage of scientific work. In a word, in his view of the role of science for society, it was less important to explain phenomena and much more important to make predictions about how things would turn out.

In the field of philosophical issues, i.e. those included in the philosophy of natural sciences, it is worth paying attention to the question of functions attributed to those sciences. In this matter Professor Marciniak was, as stated above, an heir of modern tendencies. In his opinion, the prognostic function is the main function of natural sciences, and even science as such. Predicting future events constitutes basically the most important task facing science. He did not question the exploratory function, but understood it as a stage of research work. It is difficult to state on the basis of the remaining scientific legacy whether the preference for the prognostic function of science was a tribute to applied science or the application of the results of science in practice, particularly in economic practice and economic activity, or whether it was an intrinsic scientific objective. In a way, it was a tribute towards mathematical models describing states and dynamics of states of the atmosphere and meteorological forecasts built on their basis. Professor Marciniak was a climatologist and bioclimatologist, but he was impressed by the achievements of meteorology, especially he admired the atmospheric physicists and respected the prognostic methods which constantly improved the reliability of their forecasts confirmed by empirical data.

Emphasising the significance of the prognostic function of science and its elevation above the exploratory function did not go hand in hand with questioning the validity of the principle of causality in science, which became common in contemporary times due to critics and sceptics of this principle. He did not question the need to establish cause and effect relations within science as the basis for making predictions. However, it is difficult to say whether he was a firm determinist, whether he allowed for chance as an epistemologically motivated exception to the rule, or as a manifestation of the absence of ontological dependencies between phenomena in the natural world. It is more likely that he allowed a breach in the validity of this principle in the field of social phenomena or in the world of culture in general. The new approach to the principle of causality, which gave birth to mathematical models based on chaos theory, attracted great interest in him, but apparently he considered their emergence only as an expression of the improvement of prognostic tools, and not as a reflection of the “chimeric” character of nature. A classical model of deterministic or probabilistic relations appealed to him more than a model based on deterministic chaos.

## KAZIMIERZ MARCINIAK'S METHODOLOGY AND PHILOSOPHY OF SCIENCE

Transgressing positivistic conventions by Professor Marciniak was also revealed in the area of applied research methods. In the later period of his scientific activity, in research works that he was in charge of, different research methods were used, characteristic both for natural sciences and social sciences. In the latter case, the method of diagnostic survey was used particularly often, especially the questionnaire technique. Tourist attractiveness, motivation, consumer satisfaction or opinions on the destinations of tourist trips were examined. It must be admitted, however, that the author in question was closer to quantitative than qualitative methods. In general, the research was simple, i.e. it concerned all statistical units of the surveyed population, and the method of statistical analysis was applied in processing the data. Representative research based on random sampling and statistical inference was also carried out. This proves that the author in question did not adhere strictly to the naturalistic assumptions associated with positivism, i.e. methodological monism. The diversity of methods and techniques used was an expression of the conviction that the method should be adapted to the subject matter, and not the other way round. Through his own and guided research, he expressed methodological pluralism, which is in a way inscribed in the complex subject of geography.

Nevertheless, as a representative of natural sciences, he tended to stick to facts and make generalisations out of them. He used a typical, yet somewhat archaic research strategy based on inductive reasoning, according to the scheme of scientific and probabilistic induction, as long as he did not use statistical inference<sup>5</sup>. The hypothetical-deductive strategy, which, in the opinion of philosophers of science, is more effective and more frequently used nowadays, was familiar to him, as evidenced by his diploma theses of which he supervised. However, it should be stated that falsificationism was not the dominant methodological approach of his research. He personally attached a greater role to induction, as a more intuitive procedure (Wójcik, 2010, p. 24).

It must be admitted that the subject of philosophy of nature or philosophy of empirical science did not interest him enough to devote a separate study to the question of disproportion between cause and effect. He was focused on matters of his main speciality rather than on considerations of a philosophical nature, and on the other hand, as he was attached to facts, he had quite a distance from considerations of a speculative nature. He was not characterised by striving for abstract but for concrete concepts, and he valued the empirical and the actual rather than the a priori and the abstract. It would also be difficult to answer the question whether his views fit into the position of anti-essentialism, which is a rather characteristic view for the contemporary epigones of positivism.

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<sup>5</sup> Statistical inference is treated by some methodologists not as a separate type of inference than deductive and inductive, but by others as a type of inductive inference.

Phenomenalism, i.e. the conviction that natural and social phenomena exist in reality, did not, in his view, cross out the conviction that there are some permanent ontic structures of natural and social reality, hidden behind the phenomena, which give constancy to our experience of the world. At the end of this part of the study, it is worth referring to the issues related to the position of foundationalism, i.e. the so-called epistemological fundamentalism which assumes hierarchy of judgements and their justifications in science in its collective approach. The Professor did not have a special affection for a particular type of sciences, e.g. exact sciences and, as it often happens among natural scientists, for physics; neither was he “obsessed” with the search for certainty or the Cartesian ultimate point of support for all knowledge. Although he perceived science as the most evident example of human rationality, he was aware that the predicate “true” could not be applied unambiguously to different scientific theories. These theories fluctuate, they arise, develop, and then are rejected and replaced by other, more accurate and fruitful ones. Newly discovered facts that turn out to be inconsistent with the predictions of a theory frequently lead to changes in the theory. The discovered so-called anomalies do not always contribute to the immediate rejection of accepted theories, but eventually foster the emergence of new, more general theories to explain the anomalies of that theory. It seems, however, that the author in question paid little attention to the ontological assumptions of scientific theories, as he was always more interested in the empirical component or its generalizations (scientific laws) than in the metaphysical conditions of created scientific theories and the ontological correlates of their language (Wójcik, 2010, p. 15).

## CONCLUSIONS

Professor Kazimierz Marciniak’s views on science and higher education were developing over a long period of time. Theoretical knowledge acquired during his studies was confronted with empirics and beliefs of his adversaries. Although it is not possible, on the basis of his works, published and unpublished, as well as his notes and oral testimonies, to confirm that he had an original concept of science and higher education, his convictions in this respect form a coherent whole that is worth recalling and analysing.

Among his most general beliefs in matters of science, it is worth emphasizing the inextricable relation between education and scientific research, the adherence to empirics and a common-sense approach to facts and cause-and-effect relations, a critical approach to generalisations and scientific theories, methodological pluralism, and the social significance of science for social and economic development.

Summarizing the views of the author on science, it should be emphasized that his view of science is characterized by: 1) rationalism, i.e. the conviction that science is the most rational human endeavour, regardless of the methodological and technical limitations pointed out by historians and philosophers of science and the imperfections of the rational nature of researchers, 2) pragmatism, i.e.

the conviction that science arises not so much from cognitive needs as from life practice and ultimately serves non-cognitive purposes, 3) collectivism, i.e. the conviction that science is a collective undertaking, forming by scientific discussions and confrontations of scientific views (theses), as well as (meta) beliefs about the practice of science, 4) holism, i.e. conviction that individual sciences are complementary and all are equal, although the use of measurement, mathematization, accuracy of statements, fundamentality and range of applications makes natural sciences unique and exemplary, 5) unity, i.e. conviction that individual sciences can and should cooperate with each other, therefore, the tribute to complementary and multi- and interdisciplinary research, especially in the case of research on the impact of natural environment on human life and health.

Concluding this study, it is worth emphasising once again that the personal scientific and teaching activities of the author in question confirmed his convictions and views on science and its significance for higher education and social life. As an advocate of solid and reliable scientific and teaching work, he did not succumb to the temptation of an easy academic career, even though he had an extensive scientific achievements, nor did he succumb to the various fashions and novelties that entered the walls of the university.

This article opens the field for further research that should go in several directions. It seems that they should concern:

- 1) a detailed analysis of the scientific heritage of prof. Kazimierz Marciniak, especially in terms of his views on the issues of the research process, structure and structure as well as the dynamics of scientific theories in relation to idiographic natural sciences
- 2) peculiarities in Kazimierz Marciniak's approach to the issue of the role of science for the overall functioning of modern universities by showing that they are not only a reflection of typical views of scientific schools and / or scientific communities in which he participated,
- 3) extending research and analysis to include the views of other authors on the role of science in university management, its organization, including the impact of the subject classifications of sciences on the organizational structure,
- 4) it is necessary to thoroughly investigate the influence of the science authorized in a higher education institution on its educational tasks, especially on educational functions and on the formation of a student, especially on the development of research work skills.

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## ПОГЛЯДИ КАЗИМЕЖА МАРЦІНЯКА НА ЗАВДАННЯ НАУКИ

Рихард Маціолек, доктор філософії в галузі логіки у Люблінському католицькому університеті; проректор з наукової роботи та комунікацій в Університеті економіки у м. Бидгощ, вул. Гарбари, 2, 85-229, м. Бидгощ, Республіка Польща [maciolek@byd.pl](mailto:maciolek@byd.pl).

*Стаття присвячена досліднику Казімежу Марціняку та його поглядам на роль наукової діяльності в житті університету та її значення для суспільного життя. Науковець спеціалізувався на географії, кліматології та біокліматології. Його великий академічний досвід, отриманий під час навчання та наукової роботи в кількох польських університетах та в Інституті курортології в Познані, зробив його не лише чудовим дослідником, а й науковцем, чий погляд на роль науки в житті університету*

та у суспільному житті впливали на покоління представників багатьох наук, які працювали в Університеті WSG у Бидгощі. Переконання вченого, його широке бачення науки не лише як підприємства, розрахованого на комерційні цінності, ставлять його до числа видатних польських учених і філософів. Він поділився з ними не лише переконанням про пізнавальну функцію науки, яка займалася господарською діяльністю, а й помітив її високогуманістичну й облагороджуючу роль по відношенню до дослідника, в якому присутні творчі сторони його діяльності. Удосконаленню навчального процесу сприяє і наукова робота. Участь студента в будь-якій формі наукової діяльності формує його інтелектуальні і моральні здібності, виховує в душі культури слова, особливо писемного. На думку автора, головною функцією науки для всього суспільного життя є прогнозування явищ. Пошукова та дослідницька функції мають важливе значення, однак вони підпорядковані першим. Його методологічні та філософські погляди на структуру і динаміку наукових теорій характеризувались індуктивізмом і ймовірністю. Деякі його погляди на питання природи явищ, будови дійсності та співвідношення наукової теорії та реальності не були викладені однозначно; здається також, що вони еволюціонували до антифеноменалізму, антифундаменталізму та есенціалізму, що віддаляло його від сциєнтизму, як світогляду, цілком характерного для представників природничих наук ХХ ст.

**Ключові слова:** наукове дослідження; заклад вищої освіти; виховна функція науки; прогностична функція науки; індуктивізм; науковість.

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