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## NINETEENTH CENTURY DISCUSSIONS ABOUT THE POPULARISATION OF SCIENCE

Grażyna WRONA

*Pedagogical University of Kraków,  
Institute of Information Science,  
2, Podchorążych Str., Kraków, 30-084, Poland,  
e-mail: grazyna\_wrona@poczta.fm*

The article deals with the role of periodicals published in the Polish territories in the 19<sup>th</sup> century in the popularisation of science. The publications in popular science magazines “Przyroda i Przemysł” (“Nature and Industry”, Poznań, 1856–1858) and “Przyroda i Przemysł. Tygodnik popularno-naukowy poświęcony rozpowszechnianiu nauk przyrodniczych i ich zastosowaniu do przemysłu” (“Nature and Industry. A popular science weekly dedicated to the popularisation of the natural sciences and their application in industry”, Warsaw, 1872–1881) have been analyzed. These publications were not limited to merely presenting a particular question, issue or problem, but also encouraged discussion, and promoted the popularisation of science as an issue for the whole nation. The significance of science, learning and popularisation for economic progress, and also in the life of society, was highlighted by many authors.

*Keywords:* periodicals, popular science magazines, popularisation of science.

An interest in the issue of the popularisation of science in the Polish territories is not a new phenomenon, but it is distinguished by the research perspective, which confirms the need for an interdisciplinary approach to this area. This differentiation in the research allows for a comprehensive description of the issue, along with the changes and transformations that have occurred, mostly in terms of the goals and the means of communicating the message of popularisation activities. Undoubtedly, the topic is equally interesting for press specialists, as the role of periodicals in communicating content that popularised science has been emphasised in the work of many researchers, in relation to both modern and historical issues. Popular science periodicals published in the Polish territories in the 18<sup>th</sup> century have been analysed better than other publications. Danuta Hombek<sup>1</sup> and Jarosław Kurkowski<sup>2</sup> have shown an interest in these publications. Information about 19<sup>th</sup> century magazines has appeared in the work of Ryszard Terlecki<sup>3</sup>, Ludwik Zasztowt<sup>4</sup> and Grażyna Wrona<sup>5</sup>. Individual publications have been presented by Dorota Kamińska<sup>6</sup>, Andrzej Kotecki<sup>7</sup>, Małgorzata Pękalska<sup>8</sup>, and Elżbieta Słodkowska<sup>9</sup> among others. However, the history of

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<sup>1</sup> Hombek D. *Prasa i czasopisma polskie w XVIII wieku w perspektywie bibliologicznej*. – Kraków, 2001.

<sup>2</sup> Kurkowski J. *Warszawskie czasopisma uczone doby Augusta III*. – Warszawa, 1994.

<sup>3</sup> Terlecki R. *Oświata dorosłych i popularyzacja nauki w Galicji w dobie autonomii*. – Kraków, 1996.

<sup>4</sup> Zasztowt L. *Popularyzacji nauki w Królestwie Polskim 1864–1905*. – Warszawa, 1989.

<sup>5</sup> Wrona G. *Polskie czasopisma popularnonaukowe w XIX wieku. Ewolucja formy i treści // Rocznik Historii Prasy Polskiej*. – 2007. – T. 10, z. 2. – S. 5–31.

<sup>6</sup> Kamińska D. *Warszawski tygodnik “Wędrowiec” w latach 1863–1883 // Toruńskie Studia Bibliologiczne*. – 2010. – Nr 2. – S. 101–124; 2011. – Nr 1. – S. 65–86.

<sup>7</sup> Kotecki A. *Dziennik Podróży Lądowych i Morskich // Teki Gdańskie*. – 2004/2005. – T. 6/7. – S. 140–148.

<sup>8</sup> Pękalska M. *Popularnonaukowe czasopismo “Skarbiec dla Dzieci” (1830) // Rocznik Historii Prasy Polskiej*. – 2006. – Z. 2. – S. 5–19.

popular science magazines published in Poland between 1918 and 1939 has been neglected. The situation described above suggests that historians of the press still have a large and untouched area of research at their disposal.

Approaching popular science from the perspective of print media studies, or rather the history of print media, allows us to see the magazines being studied in terms of their function as an informational channel, a means of communication, or one of the ways academics communicated with society, but also to present the evolutionary process of their inside structure, to point out the range of content published, and establish the source and form of the writing. Moreover, the key to a wider perspective on popular science magazines should be reflection on the issue of how the editors of the magazines being studied understood the definition of popularisation of science and learning, its aims, effective means of communication, and also the way they created the image of academics and their approach to social needs.

Therefore, the issues that need to be taken into consideration can be divided into a few conceptual groups, although of course none of these areas can be examined in isolation from the other elements. For the sake of clarity, they can be expressed in the form of example questions, the answers to which will be supplied by the analysis of the content of the published texts: what is science and what are its social functions? How can the notion of popularisation of science be understood and what are the resulting activities associated with it? What were the main aims of popularisation activities which the editors believed should be achieved? Which categories and types of popularisation were acknowledged as representative? What were the social aspects of the popularisation of science and learning? How was the image of the academic formed? Finally, what are the tasks of a popular science periodical?

The scope of this article will not, however, allow for a development of the topic based on an analysis of all popular science magazines published in the Polish territories in the 19<sup>th</sup> century. Out of necessity, then, the essay will be limited to two periodicals, which, it should be noted, have the same title. They were not chosen at random, as they not only were the first to start popularising the technical and natural sciences, but also disseminated the principles of a contemporary approach to the aims and tasks of popularising science. They were also connected, as has already been mentioned, through having the same name. It is therefore worth presenting some basic information about them. The first – the periodical “Przyroda i Przemysł” (“Nature and Industry”), was, according to its subtitle, “dedicated to the accessible instruction of all branches of the natural sciences, their practical application to needs in life as well as the latest inventions and discoveries”, and was published in Poznań from 1856 to 1858, with the investment and fonts of Ludwik Merzbach’s Printing House. The first editor, Julian Zaborowski is recognized as the founder of this publishing venture, and he was later replaced in the role by Felicjan Sypniewski, the botanist, entomologist and malacologist.

The year 1872 is an important date in the history of Polish popular science magazines, as it was then that the first issue of the second publication we are concerned with was published in Warsaw – “Przyroda i Przemysł. Tygodnik popularno-naukowy poświęcony rozpowszechnianiu nauk przyrodniczych i ich zastosowaniu do przemysłu” (“Nature and Industry. A popular science weekly dedicated to the popularisation of the natural sciences and their application in industry”). Its founder, first editor and publisher was Karol Hertz, mathematician, educationalist and publicist, and from 1873 it was published by Seweryn

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<sup>9</sup> Słodkowska E. *Działalność wydawnicza Franciszka Salezego Dmochowskiego 1820–1871. Studium monograficzne.* – Warszawa, 1970.

Sunderland, while from issue nr. 21 in 1874, the editor was Józef Lesman. Issue 32, 1875, included a notice to the effect that the ownership of the periodical had passed to Józef Lesman and Fortunat Morgulec, co-owner of the “Cels Lewicki i spółka” (“Cels Lewicki and company”) bookshop. At that time, the weekly was published with the investment of the editorial board of “Przemysł i Przyroda”. Further changes occurred in 1878, when Karol Jurkiewicz, naturalist, mineralogist and publisher of the Gebethner and Wolff publishing house. One more important note is that it was in reference to this particular magazine that the creators used the term “popular science” for the first time. Nine volumes were published in all, with the last one dated to 1880/1881.

The texts published in each weekly do not only provide interesting material for research in the area of the development of a model for the popularisation of science, its program and method, as mentioned above, but also have a growing value due, among other things, to the lack of sources in this area, which are so important for historical research.

With reflection going in the direction established above, it is worth mentioning that the authors and editors of the published texts felt it was necessary to define “science” in what they wrote, mostly from the perspective of the roles it played in the life of each society, and so what science can bring people, what changes progress in science can bring about, the areas in which its influence is the greatest, why progress is important across all academic disciplines. Bronisław Rejchman began his answer to the questions above with a very convincing statement: “The times when science was available only to the privileged few, when academics kept their discoveries secret, fearing that the ears of laymen would defile them, have passed”, whereas in the 19<sup>th</sup> century “science has liberated itself and allows all who would like to know it to approach”, and so the effect is “to give the general public the maximum amount of academic food in an accessible form”<sup>10</sup>. The social aspect of science, then, was very decidedly emphasised, as well as its openness, which, in turn, allowed those who were interested and in search of academic knowledge to discover the world and the processes taking place in it.

The author of the article “Nauka i użyteczność” (“Science and utilitarianism”) carried out a kind of inventory of the past when he wrote with regret, “in the past, academics only saw pure science, science in and of itself, as worthy of their abilities, work and dedication, whereas they would leave anything that has a practical application to the laymen”<sup>11</sup>. In fact, he argued, the value of science should also be measured “by its usefulness in practical applications” and further that “the unification of theory and practise is becoming the slogan of our times”<sup>12</sup>. It should nevertheless be remembered, he warned, that an overly one-sided and exclusive view of science in its practical aspect could lead to “science falling into a vicious circle with its range limited to practical aims”<sup>13</sup>. This combination of theory and practise should above all be visible in technical progress, which in turn would become the driving force for the development of industry. After all, the use of new techniques and discoveries determines the direction of progress in civilisation of society, and the development of industry “should be the task of each nation”. The conviction of the important role of science and technology, their interdependence and influence on each other, came from the belief that they were the guarantee of the constant transformation of nature and societies. In the minds of the editors, and also the authors of the published texts, science had therefore

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<sup>10</sup> B. R[ejchman]. Nauka i lud // *Przyroda i Przemysł*. – 1872/1873. – Nr 1. – S. 1–3.

<sup>11</sup> Nauka i użyteczność // *Przyroda i Przemysł*. – 1872. – Nr 1. – S. 1.

<sup>12</sup> Ibidem. – S. 3.

<sup>13</sup> Ibidem.

become not only a means of meeting the basic needs of everyday life, but above all contributed to making it better.

It should be emphasised that a special role for the natural sciences was generally accepted, since, in the opinion of one of the authors, they were “closely linked to industry”, and “knowledge is a stimulus and guide for industry, and industry is the basis for education”<sup>14</sup>. The general fascination with the natural sciences and their achievements, the changes which had taken place in them and in the way they were practised was emphasised in many pieces of writing. The editors tried to persuade readers that, “This double importance of the natural sciences, both theoretical and practical, is the main reason why they have become the most exact foundation for modern education, since on the one hand they enlighten and ennoble humankind, and on the other, they provide the means to improve material wellbeing, paving the way to earthly happiness”<sup>15</sup>. As arguments which confirm the accuracy of this statement, the authors referred to the achievements of England and Germany in this area. They outlined a model of society in which the progress of science and the social need for its popularisation supported efforts to achieve quick and intense economic, social and cultural development, since by learning about nature “we take it into our care”.

There was no lack of patriotic themes and arguments in these statements, including Polish achievements in the field of the natural sciences: “thanks to the Polish genius [Nicholas Copernicus – *author's note*] a field of learning superior in perfection to all others that the human mind has worked on appeared”, unfortunately, the author of the words above noted “in the field of industrial activity, we have allowed ourselves to be overtaken by our neighbours”, and particularly harsh words were written about the Germans: “We must arm ourselves and fight against the Germanic troops, and the only effective weapons in this fight are the natural sciences and their applications”<sup>16</sup>. It should also be added, that the editorial board of the Warsaw weekly which the above quotes come from chose a fragment of Humboldt’s “Kosmos” as their motto: “Without a thorough knowledge of the natural sciences, any higher and general view of nature is only a vain and deluded effort”.

The editors, therefore, put together a plea: “it is of the utmost importance to plant a noble attachment to science in our nation, and to maintain this heritage of national pride”<sup>17</sup>. Thus, they were aiming to convince the reader that science is a measure of progress in civilisation, a part of the national cultural heritage which shapes world views and eliminates superstitions above all, influences technological progress, which is visible in most areas of industrial manufacturing, and this progress in turn is a guarantee of economic growth, as was already visible in many European countries. Enthusiasm and admiration for scientific achievements could be seen in these ideas, as well as the belief, as demonstrated by the quotations, that progress in civilisation is dependent on the fruits of science.

Even a cursory analysis of the ideas presented above indicates that the issue of science, and particularly the natural sciences, was investigated in the context of the nineteenth century concept of science, which considered that only the natural sciences fulfilled the criteria for being sciences<sup>18</sup>.

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<sup>14</sup> Nauka i użyteczność // *Przyroda i Przemysł*. – 1872. – Nr 1. – S. 1.

<sup>15</sup> Do czytelników // *Przyroda i Przemysł*. – 1856. – Nr 1. – S. 2.

<sup>16</sup> Kilka słów z powodu czterechsetnej rocznicy urodzin Kopernika // *Przyroda i Przemysł*. – 1873. – Nr 7. – S. 74.

<sup>17</sup> *Ibidem*. – S. 75.

<sup>18</sup> Jaroszyński P. *Nauka w kulturze*. – Radom, 2002. – S. 304.

The last remark in this part of the writing, in which another dimension of the sciences was noticed – was about the sciences working together: “The sciences have stopped working exclusively for themselves, and instead, all of them have one ultimate aim, to demonstrate the unity of forces and causes in nature”<sup>19</sup>.

The above remarks constitute, to a certain extent of course, an introduction to the main line of thought, which is the presentation of the views of the creators, editors and publishing authors on the definition of the popularisation of science, on establishing its essential nature, aims and tasks, pointing out links to underlying ideas of education and learning, and also diagnosing its needs and identifying the factors which limited or promoted progress in the area of the popularisation of science. We should begin with the statement that the nineteenth century reader could only grasp and understand the meaning of the development of science and its influence on technological progress, and so on everyday living conditions, thanks to various forms of popularisation of science itself. It was treated like an “instrument of civilisation”, which had gained general approval, and its source was “the progress of the natural sciences, the surprising research and discoveries of academics, which deepen the mysteries of nature”<sup>20</sup>. The editors of the Warsaw weekly thus declared: “We shall popularise what great people have discovered or invented, we shall always keep stepping forwards under the banner of knowledge and the common good”<sup>21</sup>.

The publishers told the readers, “the popularisation of science, in other words, making it more accessible, is a recent discovery”, whereas their opponents stated that “popularisation is the rape of science”, and they must be classified, in the opinion of society, as “fierce opponents of the education of the masses”<sup>22</sup>.

In the opinion of Bronisław Rejchman, the meaning of the popularisation of science was becoming broader, since it had gained “citizen’s rights, and everybody for whom the good of society is more than just a phrase, try to give it the largest possible range”<sup>23</sup>. At the same time, he emphasized that, “it has its opponents, and not just those that love darkness, those of narrow views and hearts, but also unfortunately and more importantly, people who are well educated and motivated by the best of intentions”<sup>24</sup>. This statement arose from the conviction that Polish researchers differed in their level of acceptance of, and participation in, popularisation activities, and also believed they had very limited effectiveness and that progress in this area was not likely.

So what were the aims of popularisation, in the opinion of the writers, and which of these popularisation activities should be implemented so that they could be not only valuable and interesting but above all effective? The main argument was made with the statement that popularisation “is becoming the basis for contemporary education”, “contributes to the general progress of education”, “to the improvement of material wellbeing”, “to a competent view of industry and agriculture”, moreover, actions taken in this area “ennoble humankind”. The author of the article mentioned earlier, “Nauka i lud” (“Science and the People”), saw a different aspect of these activities when he stated, “popularisation encourages people to learn and gives a general idea of the subject it is dealing with, contributes indirectly to the development of the sciences themselves, popularisation can have a desirable effect not only

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<sup>19</sup> Kilka słów z powodu czterechsetnej rocznicy... – S. 74.

<sup>20</sup> Do czytelników // *Przyroda i Przemysł*. – 1856. – Nr 1. – S. 1.

<sup>21</sup> Do czytelników // *Przyroda i Przemysł*. – 1872. – Nr 13. – S. 146.

<sup>22</sup> B. R[ejchman]. Nauka i lud... – S. 2.

<sup>23</sup> Rejchman B. Przeciwnicy popularyzacji // *Przyroda i Przemysł*. – 1874. – Nr 22. – S. 254.

<sup>24</sup> Ibidem.

on learning itself and civilisation in general, but also on industry”<sup>25</sup>. In this way, the concept of popularisation appeared with several meanings.

He also sees a more practical and concrete dimension to popularisation activities, “if we were to raise the mental level of the workers, if we were to familiarise them with the laws of physics and chemistry, then we would prepare a wide terrain for discoveries and improvements, and in this way we would contribute, not just to education in general, but to a boom in industry as well”<sup>26</sup>. One more example: “thanks to the popularisation of science, light is entering the heads of people who are called practical, and who are finally beginning to understand that the development of industry depends on progress in knowledge”<sup>27</sup>. In this way, the popularisation of science guaranteed that the level of education and morality would be raised and the causes of ignorance, backwardness, poverty and deprivation would be eliminated, and thus it “contributes to the removal of all superstitions which are harmful to the development of humanity and its material wellbeing”<sup>28</sup>.

At this point, it is worth referring to the article “O znaczeniu nauk przyrodniczych w wychowaniu średnim” (“On the meaning of the natural sciences in secondary education”), in which the author raised the issue of creative thinking and the actions of people “who know the laws of natural science and can apply them to nature itself”, meaning that they “are at a higher level” than those “who have gained certain information merely by routine”<sup>29</sup>. Thus, in the opinion of the writers, popularisation teaches people to combine scientific facts and to make them useful in everyday life, to observe natural phenomena and draw conclusions from them – it teaches “scientific thinking”<sup>30</sup>. In this example too, the statement that a lack of knowledge of scientific facts contributes to the growth of superstitions and old wives’ tales was used as an argument. In this way, the ability to define the idea of “scientific thinking” correctly, and to justify “when a thought deserves to be called scientific, and when it doesn’t”, in other words, to define and identify the criteria for scientificity<sup>31</sup>, was the guarantee of a rational view of the world.

Also, it would not be possible to report on these discussions on questions concerning the popularisation of science without mentioning the issue of self-teaching, since popularisation, in the opinion of the publishers, should stimulate a need to gain knowledge beyond its institutionalised forms, to activate readers to carry out their own scientific experiments, to initiate them. Achievements in European countries were a reference point in these statements: “In other countries, governments and private individuals are trying hard to encourage independent research. We, who imitate other countries in establishing our horse racing societies, musical societies and artistic societies, open clubs and groups, are not following in the footsteps of the English, the French or the Germans when it comes to science, we try to ennoble horses, but we care little or nothing about the education of people, we try to promote a love of the fine arts, unconcerned that the sciences are being neglected here due to a lack of educational resources”<sup>32</sup>. For this reason, the author also propounded, “by disseminating knowledge, we wanted to contribute to directing individuals who are able, but not educated, to a field of endeavour where they might become the pride of the

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<sup>25</sup> B. R[ejchman]. *Nauka i lud...* – S. 3.

<sup>26</sup> *Ibidem.* – S. 2.

<sup>27</sup> *Nauka i użyteczność // Przyroda i Przemysł.* – 1872. – Nr 1. – S. 3.

<sup>28</sup> *Badania samodzielne // Przyroda i Przemysł.* – 1873/1874. – Nr 1. – S. 1.

<sup>29</sup> *O znaczeniu nauk przyrodniczych w wychowaniu średnim // Przyroda i Przemysł.* – 1873. – Nr 26. – S. 308.

<sup>30</sup> *Cel i środki myśli naukowej // Przyroda i Przemysł.* – 1873. – Nr 5. – S. 51.

<sup>31</sup> *Ibidem.* – S. 49.

<sup>32</sup> *Badania samodzielne // Przyroda i Przemysł.* – 1873. – Nr 1. – S. 2.

nation”<sup>33</sup>. The authors of many editorial articles also noted that popularisation was connected in this way, on the one hand with education and on the other with self-teaching<sup>34</sup>.

The variety of ideas, beliefs and suggestions in these excerpts, which sometimes overlap each other in terms of content, means that many more print media sources will be necessary in order to reconstruct the main aims of the nineteenth century popularisation of science programme.

The periodicals in the study also hosted a discussion about the image and social role of an academic, with the editorial boards painting a decidedly positive picture. They wrote that popularisation is not only admiration for science and learning, but also for the work of academics and respect for the results of their work, which should, however, be accompanied by a need among society to discover the road that was taken to reach “scientific truth”. In the opinion of the writers, an academic should not only pass on information about the results of his research and its influence on everyday standards of living, and facilitate the understanding of the processes and transformations that took place, but also aim to correct the general understanding of the term “science” by popularising it. They argued that “the most distinguished academics popularise science, gaining accolades in this way”<sup>35</sup>, and moreover, in order to “serve the public” “an academic always has a ready opportunity to reveal his thoughts and announce his work”<sup>36</sup>. This fundamental change in the image of academics was due to the fact that in “the 19<sup>th</sup> century, academics not only allow those who ask to use the treasure of knowledge, but also give it to those that hardly know anything about its existence”<sup>37</sup>. It can therefore be stated that the process of shaping the idea of the academic as an authority figure in the minds of the public had begun, and the strengthening of this process was called for in texts that were published in both weeklies. Critical voices also appeared in this interesting exchange of views, pointing out negative situations. An accusation was made against Polish academics, “the hopes we placed in the contributions of the academics of our country did not come true to the extent that we were justified in expecting they would”, after all, the editors argued that, “without their contributions and help, no intentions can be realized” and they hoped that “they would obtain the scientific help and co-operation of Polish writers”<sup>38</sup>. The detailed suggestions for solutions in this area, which appear in many other texts, confirm that writers and artists were involved in increasing the level of contribution of Polish scientists to popularisation, through the press and other means.

The criticism was not only about a lack of support from academics, but even a lack of acceptance of popularisation initiatives, treating them as “the rape of science” with the participation of those who “cannot be bothered to study”<sup>39</sup>.

The discussion about the aims of popularisation and the image of the academic were closely related to the issue of the expectations of the message of popular science texts. These texts were not limited to presentations of particular points of view, but also persuaded readers to exchange opinions on those issues. The following questions arose: what do we

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<sup>33</sup> *Badania samodzielne // Przyroda i Przemysł.* – 1873. – Nr 1. – S. 1.

<sup>34</sup> *Od Redakcji // Przyroda i Przemysł.* – 1879. – Nr 1. – S. 1; *Od Redakcji // Ibidem.* – 1880. – Nr 24. – S. 277–278.

<sup>35</sup> B. R[ejchman]. *Nauka i lud...* – S. 2.

<sup>36</sup> *Do czytelników // Przyroda i Przemysł.* – 1856. – Nr 1. – S. 1.

<sup>37</sup> B. R[ejchman]. *Nauka i lud...* – S. 2.

<sup>38</sup> *Do czytelników // Przyroda i Przemysł.* – 1856. – Nr 1. – S. 1.

<sup>39</sup> B. R[ejchman]. *Nauka i lud...* – S. 3.

expect of popular teaching? What is the popular form of the natural sciences like<sup>40</sup>? Accessibility of content was stressed most of all in the writing, and a limited volume, which, of course, did not mean a “superficial” message, since “there is no way that all the facts can be remembered, which means that only those on which the edifice of science rests should be selected, and it is precisely this rule that popularisation follows”<sup>41</sup>.

The editors of the Poznań weekly took a similar stance, persuading the reader that, “we are trying our hardest to use a style that is accessible to the understanding of the public, and we value every old thought, and even the most common observation which is clearly and comprehensibly written up, over original thoughts written in an opaque style”, and so “the simplest and clearest possible style” was recommended<sup>42</sup>. French publications above all, and also German and English ones, should become models for Polish authors. The editors wrote with admiration about the former publications, “some of them shine out as models of accessible and clear teaching in this respect, unmatched so far by any nation”<sup>43</sup>.

The quality and value of Polish popular science literature was also criticised, the clear majority of it being made up of translations and rewrites of foreign texts. When encouraging young Polish naturalists to deal with Polish topics in the article “Przegląd ruchu literackiego i naukowego w dziedzinie nauk przyrodniczych” (“A review of the literary and scientific movement in the field of the natural sciences”), Adam Wiślicki wrote, “however, our young naturalists are far from a similar direction... it is easier to gain accolades by compiling or translating foreign journals than to gather flowers from our own soil at the cost of difficulty and discomfort”<sup>44</sup>. The need to fill in the gaps in the national literature thus became a significant argument. This theme would also be present in the writing published in other publications.

The style that the statements above are written in, and the arguments used, indicate unequivocally that the demands made of popular science texts in terms of formalities and content have lost none of their validity.

Doubts of another kind also arose. In issue nr. 13 of “Przyroda i Przemysł”, which appeared in 1872, the editors shared their reflections on the difficulties they had encountered when creating the magazine in a text addressed to their readers. Their doubts about whether there was any point in publishing the magazine were due above all to the lack of interest or reception on the part of readers which was predicted by opponents of popularisation. Those who were sceptical about popularisation initiatives asked, “who is going to read your magazine – for if you expect to find readers among the public, bitter disappointment awaits you, the masses prefer “Izabella and Eugenia” as their most essential publication”<sup>45</sup>.

The editorial board replied, “we do not write for academics, nor for those whose minds are content with reading irritating romances; those who need the natural sciences to complete their educations, and who wish to base their ideas and activities on a firm foundation will read our publication”<sup>46</sup>. So what roles were attributed to popular science periodicals? The range of tasks they performed can be established by identifying the intention of the writer.

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<sup>40</sup> Na czym polega forma popularna w naukach przyrodzonych? // *Przyroda i Przemysł*. – 1856. – Nr 45. – S. 363–364.

<sup>41</sup> B. R[ejchman]. Nauka i lud... – S. 2.

<sup>42</sup> Odpowiedź Redakcji // *Przyroda i Przemysł*. – 1856. – Nr 34. – S. 275.

<sup>43</sup> Na czym polega forma popularna... – S. 363.

<sup>44</sup> Wiślicki A. Przegląd ruchu literackiego i naukowego w dziedzinie nauk przyrodniczych // *Przyroda i Przemysł*. – 1856. – Nr 41. – S. 331.

<sup>45</sup> Do czytelników // *Przyroda i Przemysł*. – 1872. – Nr 13. – S. 145.

<sup>46</sup> Ibidem. – S. 146.

Above all, the dissemination of the latest scientific achievements, but since popularisation was seen as a component of ongoing education, including self-teaching, magazines made up an important and effective means of achieving this aim. They also functioned as platforms for the exchange of thoughts between the academic community and society, transmitters of content about the practical applications of inventions in everyday life, and in this way, they performed informational, educational and integrational roles. The role of giving these activities a patriotic aspect was also undoubtedly an important one. This idea is confirmed by a reader's letter to the editors of the Poznań weekly, which, in turn, became a starting point for a discussion on the need for the popularisation of the achievements of Poles in magazines. The author states that, "the weekly seems to avoid national issues. I would wish for Polish footsteps to be traced in foreign countries, since they frequently fertilized foreign domains rather than their own"<sup>47</sup>. In reply, the editors argued that, "exactly, discovering the structure and innate conditions of the earth, descriptions of nature in our native land, should be one of the main aims of our journal. We also see that indicating what services Poles have rendered in the field of natural scientific progress, and mentioning the discoveries that can be considered uniquely Polish to be one of the main responsibilities of our enterprise"<sup>48</sup>.

Therefore, there is no doubt that the concepts of popularisation of science which are presented in the texts quoted above can be seen as very innovative and, in many areas, still relevant. It must also be emphasised that these publications were not limited to merely presenting a particular question, issue or problem, but also encouraged discussion, and promoted the popularisation of science as an issue for the whole nation. The significance of science, learning and popularisation for economic progress, and also in the life of society, was highlighted by many authors.

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<sup>47</sup> J. L. [List] // *Przyroda i Przemysł*. – 1856. – Nr 34. – S. 273.

<sup>48</sup> Do Autora powyższego i do czytelników naszych // *Przyroda i Przemysł*. – 1856. – Nr 34. – S. 276.

## ДИСКУСІЇ ХІХ СТОЛІТТЯ ПРО ПОПУЛЯРИЗАЦІЮ НАУКИ

**Гражина ВРОНА**

*Педагогічний університет ім. Комісії національної освіти у Кракові,  
Інститут наукової інформації,  
вул. Подхоронжих, 2, Краків, 30-084, Польща,  
ел. пошта: grazyna\_wrona@poczta.fm*

У статті розглядається роль періодичних видань, які друкувалися на польських територіях у ХІХ столітті, в популяризації науки. Проаналізовано публікації в науково-популярних журналах “Przyroda i Przemysł” (“Природа і промисловість”, Познань, 1856–1858 рр.) і “Przyroda i Przemysł. Tygodnik popularno-naukowy poświęcony rozpowszechnianiu nauk przyrodniczych i ich zastosowaniu do przemysłu” (“Природа і промисловість. Науково-популярний тижневик, присвячений популяризації природничих наук та їхньому застосуванню в промисловості”, Варшава, 1872–1881 рр.). Ці публікації не обмежувалися представленням лише окремих питань чи проблем, але й стимулювали дискусію та сприяли популяризації науки як загальнонаціонального питання. Багато авторів висвітлювали значення науки, навчання та популяризації для економічного поступу, а також суспільного життя.

*Ключові слова:* періодичні видання, науково-популярні журнали, популяризація науки.

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