T. XXIII (2020) Z. 3 (59)
ISSN 1509-1074
10.24425/rhpp.2020.134428

ROCZNIK
HISTORII PRASY POLSKIEJ

Polskie czasopisma popularnonaukowe w latach 1758–1939 jako obiekt badań i źródło w badaniach nad dziejami popularyzacji nauki

Polish Popular Science Magazines from 1758 to 1939 as a Topic and a Source in Research on the History of Popularization of Science*

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SŁOWA KLUCZOWE:
czasopisma popularnonaukowe, popularyzacja nauki, XVIII, XIX, 1918–1939, prasa jako źródło

KEY WORDS:
Polish popular science magazines in the 18th–20th century, popularization of science, popular press as a historical source

ABSTRAKT
Czasopisma popularnonaukowe wydawane na ziemiach polskich od 1758 do 1939 roku stanowią dla badaczy cenne oraz interesujące obiekty badawcze, zarówno z perspektywy możliwości ich interdyscyplinarnego oglądu, jak również odkrywania nowych metodologicznych rozwiązań. Pozwalają ponadto uzyskać ważne informacje dotyczące nauki i jej społecznych funkcji, statusu uczonego, modelu popularyzacji nauki i jego ewolucji, kanałów oraz form komunikowania, zasad konstrukcji popularnonaukowego przekazu, także z wykorzystaniem materiału graficznego.

ABSTRACT
Popular science magazines published in Poland between 1758 and 1939 are an important resource for all kinds of research including interdisciplinary analysis as well testing new methodological approaches. They provide insights into the changing understanding of science and its social functions, the status of the scientist, models of popularization of science, the channels and forms of communications, techniques of construction of the popular science text enhanced with graphics and illustrations.

* The article was written as part of the research project "Polish popular science journalism until 1939", financed by the National Science Center [UMO 2014/15/B/HS2/01071].

Streszczenie

Ewolucja polskich czasopism popularnonaukowych, od ich początków czyli 1758 roku do wybuchu drugiej wojny światowej to proces nie tylko długotrwały, ale przede wszystkim złożony, którego przebieg determinowało szereg czynników wewnętrznych i zewnętrznych. To co je natomiast łączyło, niezależnie od geograficznego położenia, to wpisywanie się w ogólnoeuropejską tendencję fascynacji wiedzą, odkryciami, wynalazkami, przekonaniem o utylitarności nauki, jej wpływem na postęp gospodarczy. Utylitarność nauki była stanowczą odpowiedzią nie tylko na społeczną wobec niej nieufność, ale także obojętność, skutkującymi kulturowym wyobcowaniem. Popularyzacja nauki stawała się zatem koniecznością w kształtowaniu przekonania o wszechobecności nauki w życiu codziennym każdego człowieka, elementem jego edukacji oraz nośnikiem wartości moralnych i etycznych.

Dla historyka nauki, jak i historyka prasy czasopisma popularnonaukowe stanowią więc cenne oraz interesujące obiekty badawcze, zarówno z perspektywy możliwości ich interdyscyplinarnego oglądu, jak też odkrywania nowych metodologicznych rozwiązań.

Analiza zawartości treściowej tekstów zamieszczonych na łamach badanych tytułów pozwala ponadto na wielokierunkowość poszukiwań, celem uzyskania istotnych z punktu widzenia prowadzonych badań informacji, przede wszystkim dotyczących: nauki i jej społecznych funkcji, statusu uczonego, modelu popularyzacji nauki i jego ewolucji, kanałów oraz form komunikowania, zasad konstrukcji popularnonaukowego przekazu. W tym ostatnim aspekcie także z wykorzystaniem materiału graficznego.

Introduction

The evolution of Polish popular science magazines, from their emergence, i.e. from 1758, until the outbreak of the World War II, was not only a long-term process, but above all a complex one, the course of which was determined by a number of internal and external factors. Both types of these factors can be identified and interpreted from the point of view of the diversified political situation on the Polish soil, without losing sight of the changes and transformations in the then functioning systems of science organization in European countries. However, a broader development of this thread goes beyond the frame of this article. What popular science periodicals had in common, regardless of their geographical location, was that they were part of a pan-European trend of fascination with knowledge, discoveries, inventions, a conviction about the utility of science and its influence on economic progress. Utilitarianism of science was a firm response not only to social distrust towards it, but also to indifference to it resulting in cultural alienation. The popularization of science, therefore, became a necessity in shaping the conviction about the omnipresence of science in the everyday life of every human being, an element of his or her education, and a carrier of moral and ethical values. In Poland, especially until 1918, it was also one of the ways of expressing one's national identity. It is precisely the special political conditions: loss of statehood, the partitions, the regaining of independence and then rebuilding the state in all areas of its functioning, that greatly diversified the pace of development of the popularization of science in the Polish lands compared to European countries.

Thus, in the history of popularization of science, there is a multithreaded panorama of contemporary problems related primarily to the social understanding and reception of science, the channels of its dissemination and distribution of knowledge tailored to individual needs, perception and intellectual capabilities of the recipient. The findings of foreign researchers head in a similar direction as well. However, they are largely contemporary oriented, while the historical perspective appears relatively rarely. Occasional studies dedicated to popular science periodicals are also available. An interesting projection concerning, among other things, the idea of their appointment and their past functions was presented by an English researcher, Peter J. Bowler. The author claims persuasively that the popularization of science through periodicals not only did not strengthen the social perception of the scientist's position but played an

opposite role regarding the authority of professional scientists, which was growing in the 19th century, which is particularly interesting. Of course, one cannot fully agree with this course of thinking. He supported his arguments with the example of the popular weekly *Knowledge* established in 1881 in Great Britain by the astronomer Richard A. Proctor, which, according to his concept was to prove that both astronomy lovers and non-professionals can also make a significant contribution to the development of science. In support of his thesis, he referred to the *Scientific American* founded earlier in 1845, addressed to recipients interested in new technology and applied sciences.[1] Historical themes relating to popular science press emerged also in the work of Andreas Daum,[2] Susan Sheets-Pyenson,[3] Ruth Barton[4] and Ernest Homburg.[5]

The proposals that placed the popularization of science within the theory of scientific communication turned out to be interesting, while popular science periodicals were the channels in this process.[6] Research on the history of science popularization, therefore, already has a certain tradition. The growth of this interest was fostered, among others, by the development of communication channels, i.e. the media, in this particular case the press. The authors of this article, pointing out the possibility of taking the widest possible view of the popularization of science and the channels of its dissemination, offer future researchers a comparable research perspective — at least to some extent, i.e., in terms of research on scientific communication.

Popular science periodicals as research items

The emergence of popular science magazines in Poland in the second half of the 18th century, on top of their development at a varied pace and in subsequent periods, contributed to the creation of new areas of interaction between the scientist and

[1] P.J. Bowler, *Science for all: the popularization of science in early 20th-century Britain*, Chicago – London 2009; idem, *The popularization of science*, European History Online [online] 2015 portal EGO [retrieved: 25.03.2020].

[2] A. Daum, *Wissenschaftspopularisierung im 19. Jahrhundert. Bürgerliche Kultur, naturwissenschaftliche Bildung und die deutsche Öffentlichkeit 1848–1914*, München 2002.

[3] S. Sheets-Pyenson, *Popular science periodicals in Paris and London: the emergence of a low scientific culture, 1820–1875*, "Annals of Science" 1985, vol. 6, pp. 549–572.

[4] R. Barton, *Just before Nature: the purposes of science and the purposes of popularization in some English popular science journals of the 1860s.*, "Annals of Science" 1998, vol. 55, pp. 1–33.

[5] E. Homburg, *From Chemistry for the People to the Wonders of Technology: the popularization of chemistry in the Netherlands during the nineteenth century*, "HYLE — International Journal for Philosophy of Chemistry" 2006, vol. 12, pp. 163–191.

[6] *Popularizing science and technology in the European periphery 1800–2000*, ed. by F. Papanelopoulou, A. Nieto-Galan, E. Periguero, London – New York 2009.

society. Their role, regardless of the period in which they operated, was primarily to provide the reader with a certain amount of knowledge about the progress of science, the directions of conducted research, discoveries, inventions, the possibility of their application in everyday life, in addition to stimulating and shaping the need to obtain information for cognitive, educational and self-education purposes. Thus, for a historian of science and a press historian alike, popular science press provides valuable and interesting research items, both from the perspective of their interdisciplinary overview and the discovery of new research areas and methodological solutions.

Undertaking research in this direction required, first of all, a definition of future research material, resulting in the development of a new definition of a popular science periodical, irrespective of the already existing ones and adequate to the scope of the research for the project.[7] It should also be stressed that the condition for effectiveness and success in the implementation of the next stage of the research activities was the ability to apply it to changing historical conditions and, as a result, it was necessary to select universal features of this type of publications. The differences in defining them mainly affected formal problems, which have not yet been satisfactorily solved. Thus, the authors considered the popular science magazine as a periodical publication fulfilling the assumptions and objectives of popularizing science understood in terms of content, institution and organization, and disseminating scientific knowledge, addressed to non-specialists with different needs and degrees of preparation for the reception of scientific content.[8] The latter was considered to be of particular importance as the message was only effective when the recipient had the appropriate knowledge. Additionally, the formal determinant of this category of magazines was the possibility of assigning specific titles to a specific scientific discipline or group of disciplines. On the other hand, special care should be taken in qualifying activities and select professional, hobbyist, advice, educational, and even socio-cultural or scientific periodicals. Of course, a question arises about the effectiveness of such actions. The success of the selection was therefore determined by the consistent application of the selected determinants: the publisher's program declarations, title or subtitle, and the scope of the content presented in terms of the content itself and the construction of the message.

[7] S. Dziki, *Czasopisma popularnonaukowe,* [in:] *Encyklopedia wiedzy o prasie*, ed. J. Maślanka, Wrocław 1976, p. 50; W.M. Kolasa, W*spółczesne czasopisma popularnonaukowe. Studium analityczne na przykładzie „Wiedzy i Życia" oraz „Świata Nauki"*, „Rocznik Historii Prasy Polskiej" 1998, Iss. 1/2, p. 151; M. Rogoż, *Czasopisma popularnonaukowe dla dzieci i młodzieży w latach 1989–1996*, „Rocznik Historii Prasy Polskiej" 2000, Iss. 1, p. 153; R.M. Zając, *Czasopisma popularnonaukowe w Polsce w latach 1945–1989*, Kraków 2016, p. 19; A. Daum, *Wissenschaftspopularisierung im 19. Jahrhundert. Bürgerliche Kultur, naturwissenschaftliche Bildung und die deutsche Őffentlichkeit 1848–1914*, München 2002, p. 341.

[8] E. Wójcik, G. Wrona, R. Zając, *Polskie czasopisma popularnonaukowe do 1939 roku.* T. 1. *Dzieje i rozwój*, Kraków 2018, p. 9; eidem, *Polish popular-science magazines until 1939 — a historical outline and development*, "Rocznik Historii Prasy Polskiej" 2019, Iss. 1, pp. 5–21.

It was also worth answering the question: did Polish popular science periodicals published in different historical periods have any common features? Despite, as has already been mentioned, numerous definitions and typological problems — two definitions resulting from function — can be distinguished: one documenting program assumptions of the popularization of science at a given stage of its development and reflecting social attitudes towards it. In this case, the press becomes a channel in the transmission of a certain message, as already indicated above.

To conclude this fragment of the deliberations, it should be stressed that the definition proposed herein does not fully define the issue of understanding the term "popular science magazine", crucial for the research both nowadays and in the historical perspective. However, it undoubtedly clarifies the already existing definitions, and, moreover, it is equipped with a set of determinants that allow for a quite precise identification and classification.

The collection studied consisted of 128 independent titles, which were described and evaluated according to procedures used in press research. First of all, the development line and conditions stimulating or impeding this development were defined, both globally and in individual sub-periods. Then, the circumstances of the creation of individual titles were indicated. The content and formal analysis was carried out (program, editing, structure, authors, physical form, recipient). The formal characteristics were enriched by the presentation of the titles according to the adopted typology. Outlining the evolution of the internal structure was valuable due to the uniqueness of the research conducted in this field, and it was carried out using the entire collection of popular science periodicals.

As a result of detailed analyses, as already mentioned, 128 popular science magazines published in Poland from 1758 to 1939 were chosen for the research. The lower cut-off date was set by the year in which the first Polish popular science periodical, "Nowe Wiadomości Ekonomiczne i Uczone" ("New Economic and Scientific News") was published, while the second one does not require explanation. The examined collection included periodicals diversified both formally and in terms of content, 19 of which were published in the 18th century, 50 dated between 1795 and 1918, i.e., during the period of lost independence, while in the period between the two World Wars the Polish press publishing market was represented by 61 periodicals. Most of them popularized natural sciences (42), while 41 of the remaining ones were of a general character, 27 were connected with medical sciences, and 13 with humanities and social sciences. The least numerous group were magazines popularizing technical sciences (5).

The periodicals under analysis were characterized by a short presence on the publishing market, caused by a number of factors, mainly financial difficulties, small numbers of recipients, problems with the inflow of valuable and interesting materials, as well as the editors' inability to work out unambiguous and attractive formulas for the magazines. Undoubtedly an exception is "Wszechświat" (1882), one of the most

interesting and best edited initiatives among the periodicals analyzed. It is also worth noting that the title is still being published and belongs to the longest-running nature magazines in the world.

The establishment, development and popularity of popular science periodicals in Poland, especially in the first two periods, were determined by two factors: the development of such publications in European countries on the one hand, while on the other hand, the lack of native equivalents created by Poles, and taking into account, of course, the intellectual capabilities of the recipient. Their goal was to provide the reader with a certain amount of basic or extended knowledge about the progress of science, directions of research, discoveries and inventions, possibilities of utilizing new achievements in everyday life, stimulating and shaping a need for gathering information for cognitive, educational and patriotic-educational purposes.

It was a continuous process, varying both quantitatively and qualitatively. A characteristic feature of the 18th century popular science periodicals was their ephemerality and short-lived issuance, mainly due to a lack of audience. The low number of regular subscribers was due to the lack of interest in such publications and the low level of readership in the Polish society. The basic reading in the homes of the nobility, especially in the country, and in bourgeoisie homes, remained religious books and almanacs. As a political, scientific and cultural center, Warsaw was the main producer and consumer of "semi-scientific" magazines (as they were referred to), with only four of them appearing outside the capital city[9]. These publications were most often magazines disseminating knowledge about new discoveries and inventions to Poland in order for them to be used in practice. Therefore, they popularized mainly economy, agriculture, medicine, natural sciences, but also history and natural sciences.

The increasing emphasis on the links between science and technology and, consequently, the hope of improving everyday life conditions, development and progress in natural sciences, was the basis for further intensification of popularization initiatives in the 19th century. At the same time, there was a discussion on the new image of the scientist and the need to draw a positive one. During this period, the popularizers aimed at extending the offer of implementation tools, increasing the social range of knowledge disseminated, and started profiling the message, matching it to the level of the recipient. It was in that period when the first popular science magazines addressed to young readers appeared. Undoubtedly, foreign patterns, mainly German, English and French, became stimuli for the development of popular science magazines in the 19th century on Polish soil. The editors drew not only the finished texts from them, but also the publishing formulas and elements of internal structure. The next changes in the shape of the popular science magazines consisted in

[9] D. Hombek, *Prasa i czasopisma polskie XVIII wieku w perspektywie bibliologicznej*, Kraków 2001.

moving from imitating foreign patterns to creating a model based on domestic material, cooperating with Polish scientists as authors and members of the editorial board. The need to shape patriotic patterns of behavior was also important. In the period of positivism, the popular science magazine model was strongly connected with the ideas of working at the grassroots level, by creating a broad foundation of a rational society, benefiting from progress, especially in natural sciences and technology.

The restoration of independence created favorable conditions for the development of this category of periodical publications. The establishment of multifunctional educational institutions for adults, and the rebuilding of universal, secondary and higher education systems, fostered a rise of readership, increased the need for self-education and the development of knowledge about the progress of science. As a result, the group of people interested in science and technology, whose accelerated development took place after the end of World War I, was expanding. Thus, there were still some magazines popularizing Polish history, sightseeing, natural exact sciences, nature protection, and technical sciences. A special role was played by medical periodicals, which promoted pro-health behaviors, including hygiene, since the priority tasks of successive governments of the Republic of Poland were to combat social disease and improve the sanitary condition of the country.

During the analyzed sub-periods, popular science magazines also evolved in terms of editing and publishing form on top of their internal structure. The eighteenth-century magazines, usually printed in a 16 library format, did not have an extensive internal structure and were mainly reprinted from foreign publications. In the nineteenth century, a modern formula of a popular science magazine was developed in terms of editing and publishing, no longer having a title page, which was replaced by a vignette, and with an extensive internal structure that was constantly modified. In the next sub-period, 1918–1939, we see further transformations in the structure of the periodicals under study, but they did not take such radical forms. On the other hand, the short duration and irregularity of certain elements, a common feature of the sub-periods mentioned above, most often resulted from the randomness and diversity of the material coming to the editorial offices.

The presence of illustrations, technical drawings and photographs containing visual information in popular science magazines made it easier for readers to interpret the text and consequently strengthened their interest in the presented issues. The illustrations also introduced the reader to the scientific research workshop and familiarized them with the results, aroused interest among adults and youth alike in the achievements of science and technology, encouraging them to their own studies and stimulating independent thinking. The success of the illustrated popular science periodicals proved the need for education in society, combined with curiosity and readiness to accept new content concerning the development of science and technology and the application of inventions in everyday life and work. After the period of reprinting foreign texts (until the end of the 19th century) in Polish popular

science press, Polish authors developed their own style and way of reaching readers of different age groups with difficult content. Illustration became an important element of the articles, emphasizing the importance of the topics discussed due to their complex nature, requiring the reader's effort and commitment to understand the new content. Illustrations performed an informative function, explaining and supplementing the content of the publications.[10]

The reconstructed picture of the history of Polish popular science magazines, documenting the sequence of efforts, aspirations of their authors, publishers and editors, is characterized by a certain universalism in the scope of their functions, including, above all, the promotion of their program assumptions to popularize science. However, the different political, economic and cultural conditions meant that their quantitative and qualitative development, although uneven in the discussed sub-periods, was characterized by a common strategy in the activities of the publishers. The strategy was driven by the already indicated utilitarianism present in the dialog between the author of the popular science message and its recipient. Individual or team press initiatives took over the function of a medium that enabled the society to establish contact with scientists and their work, the effects of which the reader saw in everyday life.

The studied collection of Polish popular science press was obtained via a comprehensive survey located in a publicly available electronic database.[11] At the same time, the diversity of the material, from the perspective of Press Studies and scientometric point of view, as well as from the position of particular fields of science represented in popular science press, made it possible to indicate at least several directions of possible further analyses. It is worth to point out several themes to the attention of future researchers. Undoubtedly, it would be interesting to have a deeper insight into the texts published in the popular science press, taking into account the press and linguistic workshop, the informational quality of the articles, their typology, composition, timeliness, reliability and effectiveness of the message.

In order to record and read the richness of the published material as widely as possible, it was necessary to conduct a multilateral analysis of the graphic material of selected Polish popular science periodicals and compare it to the similar European publications. Much attention was therefore paid to the thematic typology of the

[10] D. Kamisińska, *Polskie czasopisma popularnonaukowe do 1939 roku.* T. 2. *Związki nauki ze sztuką*, Kraków 2018; eadem, *Grafika polskich czasopism popularnonaukowych XVIII wieku*, „Rocznik Historii Prasy Polskiej" 2016, Iss. 3, pp. 5–42; eadem, *Imaginacja podaje rękę nauce, a ich związku owocem jest oświecenie: szata graficzna polskich czasopism popularnonaukowych w XIX wieku*, „Rocznik Historii Prasy Polskiej" 2017, Iss. 2, pp. 21–54; eadem, *Układ graficzny polskich czasopism popularnonaukowych XIX wieku*, „Rocznik Historii Prasy Polskiej" 2017, Iss. 3, pp. 5–37; eadem, *Polish popular-science periodicals published until 1939. Interrelationships between science and the arts*, "Rocznik Historii Prasy Polskiej" 2019, Iss. 2, pp. 5–26.

[11] http://www.bg.up.krakow.pl/czas-pop-nauk/czasopisma_list.php.

images and to the particular type thereof — technical drawing, as the graphic elements and their layout are, besides the texts, the basic components of a magazine. The comprehensive research of Polish popular science periodicals was aimed at systematizing and categorizing the elements that make up the layout and illustrations, establishing the authorship of the illustrations, and demonstrating the impact of this important part of a magazine on its aesthetic and educational value.

The initial assumption had to be verified: that technical issues were very widely present in the periodicals studied, and that the leap of civilization which humanity experienced needed to be "tamed" to the greatest extent by approximating its scientific foundations to the readers. Thus, more questions were asked. Did and to what extent did popular science magazines introduce their readers to the practical applications of life science achievements in technology and technical sciences? Did the periodicals provide information or make predictions about the directions in which the inventions entering everyday life would develop? Did the popular science press comment on the new technical solutions already applied in everyday life, which the reader already had the opportunity to encounter, e.g. explaining the principles of their operation? To obtain answers to these questions, detailed research and analyses were required, which resulted in interesting and valuable material.[12]

In addition to the lecture, based on a solid foundation of natural sciences and the laws of physics, there were sensational, albeit serious reports of new inventions, which were aimed at improving the functioning of the city, manufacturing, or households, in the popular science press. In the nineteenth century, it was difficult for the popular science press to compete with the large daily newspapers in this respect. An interesting thread of popular science journalism turned out to be attempts to alleviate social fears of human labor being replaced by machines, i.e., with all proportions preserved, a dilemma that still appears today in the discourse on civilization progress.

Popular science magazines as a source for research

The press as a source, regardless of the generational and social affiliation of its recipients, has been recognized and explored by representatives of various scientific disciplines. Its source value is undoubtedly determined by the fact that it always remains, on the one hand, a component of culture and, on the other, a testimony of past eras. In this fragment of our deliberations, we selected the information strictly

[12] A. Cieślikowa, *Polskie czasopisma popularnonaukowe do 1939 roku.* T.3. *Technika na łamach*, Kraków 2018.

concerning the formal aspects of the examined items, indispensable for their identification and description, focusing only on the set of information published in the periodicals.

However, due to limited possibilities, the above comments can only be seen as an introduction or encouragement to the topic. The statements presented in the following section should be treated only as a suggestion, not as a detailed examination, all the more so since it is written into a rather limited context.

The analysis of the content of the texts published in the examined press allows for scientifically significant multidirectional queries in order to obtain information, mainly concerning science and its social functions, the status of the scientist, the model of popularization of science and its evolution, channels and forms of communication, on top of principles of the construction of popular science message (in this latter aspect, including the use of graphic material). In the conditions of the lack of free circulation of information in occupied Poland, especially in the 19th century, the periodicals under study became an important forum for the exchange of ideas, also in terms of content concerning science and its creators. Therefore, we devoted a few sentences to each of these issues.

Thus outlined, considerations should therefore begin by noting that in many published texts it was deemed necessary, above all, to define the concept of "science". The most effective strategy in this respect which was chosen by publishers, editors and authors, turned out to be the perspective of its social functions, i.e. to answer the questions: what does science bring to people, what changes in their daily lives it can cause, in which areas of human life does science have the greatest influence, and why is it important for them to cooperate in an interdisciplinary way. Unfortunately, for researchers, the use of this type of material is too one-dimensional, because while in most cases the authors of the texts were in the area of science and technology, it was no less in line with the European, and then global trends in activities popularizing science. In the selection of evidence confirming and explaining the presence of science, or more precisely the effects of the work of many scientists in the everyday life of a person, one can see interesting material for future research, i.e. a possibility of looking for an answer to the question what manner of selecting arguments proved to be the most effective in order to attract the widest possible range of readers.

The issue of the availability of information regarding the progress of science in Western Europe and America as discussed in the Polish press is worth a detailed examination. As can be seen from national popular science journals, the authors of these publications drew their knowledge from French, English, American or German scientific, professional or popular science journals, as well as from various printed transcripts of lectures or research reports. The sources of information were often the flagship nature magazines: the English "Nature" and the French "La Nature", or the already mentioned "Scientific American". Sometimes, the discussion of an issue was

based on the author's personal experience of lectures given by scholars in Paris or London. With the current access to digitized resources of foreign press, it would be possible to try to illustrate precisely from which directions the authors of popular science publications received foreign materials and what the selection looked like.

Information about the progress of science coincided with the creation of a positive image of the scientist, who, as the editors argued, "always has a ready opportunity to reveal his thoughts, announce his work".[13] And this aspect should be of interest to future researchers, since the authority of the scientist as a research category, also over the centuries, has dominated the sociology of science. This image certainly evolved. It would therefore be interesting, for example, to discuss with the position of the already quoted P.J. Bowler, but in relation to Poland in different historical periods.

Since the overall history of popularization of science in Poland did not find a wider interest among researchers, the need to use magazines to reconstruct it is fully justified. Popular science periodicals not only documented the discourse around the definition of popularization of science, its essence, goals and tasks, links with education, but also pointed to various dissemination channels. It is particularly worth explaining the popularization of science as a long-term historical process, in which its individual elements undergo transformations depending on the level of recipients on the one hand, and the available communication channels on the other.[14] Various initiatives emerge from the periodicals, undertaken by both Polish and foreign institutions, including universities, colleges, scientific and educational societies, publishing institutions, and editorial offices of magazines. Few editors followed that model. For example, the national scientific literature has not included, apart from residual information, studies on the history of Polish popular science books.[15] Examples of this type can be multiplied. And in this respect, popular science periodicals provide interesting data and insights.

Authors of published research devoted a lot of effort to the construction of the popular science message. Solutions were searched for in many ways, considering different variants and projects in terms of both the substantive and linguistic layers. The authors were aware of the poor quality of popular science texts, their low level of readability and, consequently, the need for a very clear definition of the requirements for the transmission of popular science content. Therefore, the editors' attention was focused primarily on defining the concept of "accessibility of the message" and on pointing out other important features from the perspective of the recipient, which

[13] *Do czytelników*, „Przyroda i Przemysł" 1856, Iss. 1, p. 1.

[14] G. Wrona, *„Prasa dalej rozpowszechnia te prawdy, popularyzuje je i tym sposobem kraj cały staje się uczestnikiem wiedzy". Dziewiętnastowieczne dyskusje wokół popularyzacji nauki*, [in:] *O etosie książki. Studia z dziejów bibliotek i kultury czytelniczej,* ed. T. Wilkoń, Katowice 2017, pp. 434–446.

[15] D. Hombek, *Książka polska w ogłoszeniach prasowych XVIII wieku,* t. 6: *Czasopisma i efemeryczne gazety warszawskie 1753–1794,* Kraków 2016.

included the need to adapt the content to the level of knowledge and intellectual capabilities of the reader, selection of interesting content and its attractiveness. Yet, of course, the publishers were aware of the difficulties in achieving these goals. In one of the texts, we read: "It is rare for a great scholar to have the time and opportunity to popularize his science: the common history of popular science literature has known very few Faradays and Tyndales."[16] Therefore, a question can be asked: who popularized science and who was the creator of the popular science message? This question is also waiting for an answer.

An interesting complement would be a different research perspective, which would make it possible to distinguish and then classify the linguistic means of persuasion used by the authors of the texts printed in popular science magazines, thanks to which the message was not only "accessible" but also interesting enough to influence the future interests and behavior of the recipients.

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[16] *Tysięczny numer „Wszechświata",* „Wszechświat" 1901, Iss. 21, p. 324.

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