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Polskie czasopisma popularnonaukowe do 1939 roku. Związki nauki ze sztuką

Polish popular-science periodicals published until 1939. Interrelationships between science and the arts*

Dorota
KAMISIŃSKA

Ośrodek Badań nad Mediami
Uniwersytet Pedagogiczny im. KEN
ul. Jęczmienna 9
PL 31-268 Kraków
e-mail: dorota@ktd.krakow.pl
https://orcid.org/0000-0002-7442-1970

SŁOWA KLUCZOWE:
grafika prasowa XVIII i XIX wieku, grafika prasowa 1900–1939, polskie czasopisma popularnonaukowe do 1939

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ABSTRAKT
W artykule zaprezentowano zarys wyników badań grafiki pięćdziesięciu polskich czasopism popularnonaukowych, ukazujących się na ziemiach polskich od 1758 do 1939 roku.

ABSTRACT
The paper offers an outline of research into the graphic design and layout of fifty Polish popular-science periodicals, as published on the Polish lands in the period spanning 1758–1939.

* Research assumptions for project implemented in Pedagogical University of Cracow, financed by National Science Centre (nr 2014/15/B/HS2/01071): *Polish popular-science magazines until 1939* (*Polskie czasopiśmiennictwo popularnonaukowe do 1939 roku*); The text comprises some select excerpts from the book, published under the title *Polskie czasopisma popularnonaukowe do 1939 roku. Związki nauki ze sztuką* by Wydawnictwo Naukowe Uniwersytetu Pedagogicznego w Krakowie in 2018, ISSN 0239-6025; ISBN 978-83-8084-220-5.

Streszczenie

Polskie czasopisma popularnonaukowe nie zostały dotychczas zbadane pod względem układu graficznego oraz szaty graficznej. Podjęcie szczegółowych analiz z tego zakresu miało na celu prześledzenie rozwoju grafiki czasopism wydawanych na ziemiach polskich od 1758 do 1939 roku, wskazanie charakterystycznych elementów składających się na zewnętrzny kształt periodyku oraz, w powiązaniu z wynikami badań materiału ilustracyjnego — wykazanie wartości estetycznych i edukacyjnych ilustracji. W artykule przedstawiono zarys wyników badań grafiki pięćdziesięciu czasopism, reprezentatywnych zarówno pod względem wymienionych zagadnień, jak i popularnonaukowego typu periodyków. Pełne wyniki badań wraz z materiałem faktograficznym i tabelami danych przydatnych w dalszych badaniach porównawczych zawarto w książce.

Summary

Polish popular-science periodicals have not yet been researched in terms of their overall graphic design and layout. Undertaking an in-depth assessment of this particular aspect was intended to follow the development of graphic design in the periodicals published on the Polish lands throughout the period spanning 1758–1939, with a view to identifying the most characteristic components that stood for overall visual appeal of specific publications, whilst pondering overall aesthetic and educational value of diverse illustrative material they offered to their readership.

The article presents an outline of research into the graphic design of fifty such periodicals, highly representative of a popular-science genre. Comprehensive research results along with the accompanying factual material and tabularised data, which might well prove of some consequence in further comparative research, are available in a book format.

Overall visual appeal of periodicals seldom makes the subject of academic reflection. Press graphics, mostly construed as the illustrations only, are at best regarded as supplements and graphic extras to the printed content. Whereas, in fact, overall design and the actual graphic layout of a periodical are the key distinguishing components of such a publication, being also of appreciable educational impact, as well as instrumental in public perception of an entire publishing house in terms of overall aesthetics it espouses. In the case of popular-science periodicals, this peculiar "interrelationship between science and applied arts" is affected both by the quality of printing materials and overall technical advancement of the typographic processes entailed in their publishing, not least by what a column of print looks like, along with the way the subject matter at hand is addressed in the text, a specific number of illustrations inserted, and diverse graphic techniques entailed in rendering them.

The difficulties entailed so far in undertaking by the press historians a specifically targeted research in this area have principally been owed to the lack of the actual concept for a comprehensive way of addressing this issue, resultant both from the overlapping areas of research, i.e. the history of periodicals/press publishing and the history of the arts at large. To start with, this overlapping accounted for inconsistent terminology, as well as suffered from general non-availability of a readymade research paradigm and pertinent typologies, established in line with the specific, consistently, and rigidly applied terms of reference. Disregarding altogether the issue of journal illustrations effectively made any assessment of their content perceptively incomplete, as the research anchored exclusively in the actual content is hardly capable of offering the "big picture" with regard to individual publications, as well as renders it exceedingly difficult to attempt any meaningful comparisons, also with regard to the journals of foreign origin, consequently leaving aside a virtual treasure trove of iconographic material without a feasible chance for a comprehensively structured, academic reflection.

The present research undertaken by the Author, armed with specific research tools that belong in the methodological workshop of a *bona fide* press historian, additionally aided by a number of methodological concepts from the area of the arts, made it possible to have the presently available findings effectively supplemented, as well as contributed to broadening the actual scope of knowledge on the popularisation of science in Polish society, through domestic illustrated magazines over almost a two hundred-year span.

The monograph publication offers a multifaceted assessment of diverse graphic material encountered in select Polish science promoting periodicals, published in 1758–1939, juxtaposed against similar European publications, whilst highlighting the thematic typology of graphic representations, and the specific types of illustrations, i.e. technical drawings/illustrations. The book consists of two chapters (each preceded by an introduction) followed by a general summary. It also contains an annex comprising 37 tables, a comprehensive listing of all illustrations appearing throughout the text, a list of full-page illustrations, references, and an index of names.

The first chapter — *Graphics in Polish popular-science periodicals until 1939* — outlines the state of research on graphic design in Polish popular-science periodicals, and the methods actually applied in the Author's own scope of research. European models of this type of illustrated publications are addressed, followed by a set of 50 Polish popular-science periodicals, subjected to an in-depth appraisal. Evolution of the graphic layout components, ongoing changes in the graphic design, as well as the actual content of the illustrations and their development juxtaposed against the advances of science in the 18th, 19th c., and the period spanning 1900–1939, are diligently addressed and augmented with numerous explications. A separate subchapter deals with the artists who used to regularly contribute those illustrations throughout the above-referenced historical period under study. The first chapter is rounded up with a summary of the effect the graphic materials had on overall visual appeal of the periodicals at issue, and with a brief outline of a popular-science character of the illustrations, and their attendant significance.

The second chapter — *Technical illustrations as a special-purpose type of illustrations promoting science in Polish popular-science periodicals* — is focused on their typology, specific techniques entailed, and respective types of technical illustrations, their subject matter, as well as the role they played. The text is liberally illustrated with the examples of technical sketches, diagrams, drawings, photographs and composite photos. This part of the book is concluded with a roundup highlighting overall significance of technical illustrations in popular-science periodicals. All factual and numerical data are tabularised, with a view to being used in future comparative research projects.

Current state of research on graphic design in Polish popular-science periodicals

Polish press historians seemed to show relatively little interest in the graphic design of periodicals at large. Their output merely touched upon this issue (Stanisław Peters, Bartłomiej Golka), primarily in terms of contextual appraisal of the differently profiled journals (Danuta Hombek, Klaudia Socha, Jarosław Kurkowski, Józef

Szczepaniec, Grażyna Wrona, Leszek Zasztowt, Aleksander Zyga, Gabriela Socha, Bartłomiej Szyndler, Marta Pękalska, Tadeusz Frączyk, Hanna Tadeusiewicz, Jan Pazdur)[1]. Also book and art historians addressed this domain rather selectively, while pursuing their research into the book typography and graphics (Danuta Heckermann, Andrzej Banach, Janina Wiercińska, Janusz Sowiński), usually picking off some illustrations for museum exhibitions purposes, for some catalogues of engravings (Anna Kotańska, Ewa Łomnicka-Żakowska), or for some special-focus projects, although those were never anchored in scientific, nor technical matters (Małgorzata Quinkenstein, Alicja Rudniewska, Kamilla Pijanowska)[2].

Very few contributive studies dealt with the graphic design of Polish periodicals, whilst highlighting the need for a comprehensive approach to the issue, and its due evaluation in terms of attendant historical constraints (Przecław Smolik, Mieczysław

[1] S. Peters, *Ilustracja prasowa*, Kraków 1960 (despite its promising title, the book does not offer a *bona fide* academic appraisal, being rather a historical outline of overall development of illustrative materials intended specifically for the press, while also focusing on any hands-on practicalities of a press photographer's daily work); B. Golka, *Rozwój drukarstwa prasowego i układu graficznego prasy polskiej do roku 1939*, „Rocznik Historii Czasopiśmiennictwa Polskiego" 1971, z. 3, s. 277–302; D. Hombek, *Prasa i czasopisma polskie XVIII wieku w perspektywie bibliologicznej*, Kraków 2001; K. Socha, *Prenumeratorzy „Zbioru Tygodniowego Wiadomości Uczonych" (1784–1785)*, „Rocznik Historii Prasy Polskiej" 2002, z. 2, s. 45–65; J. Kurkowski, *Warszawskie czasopisma uczone doby Augusta III*, Warszawa 1994; J. Szczepaniec, *Monopol prasowy Tadeusza Włodka w Polsce w latach 1793–1796*, „Ze Skarbca Kultury" 1964, z. 16, s. 5–115; G. Wrona, *Polskie czasopisma naukowe w latach 1918–1939*, Kraków 2005; eadem, *Polskie czasopisma popularnonaukowe w XIX wieku. Ewolucja formy i treści*, „Rocznik Historii Prasy Polskiej" 2007, z. 2, s. 5–21; L. Zasztowt, *Popularyzacja nauki w Królestwie Polskim 1864–1905*, Wrocław 1989; A. Zyga, *Krakowskie czasopisma literackie drugiej połowy XIX wieku (1860–1895)*, Kraków 1983; G. Socha, *Andriolli i rozwój drzeworytu w Polsce*, Wrocław 1988; B. Szyndler, *Tygodnik ilustrowany „Kłosy" 1865–1890*, Wrocław 1981; M. Pękalska, *Popularnonaukowe czasopismo „Skarbiec dla Dzieci"* (*1830*), „Rocznik Historii Prasy Polskiej" 2006, nr 2, s. 5–19; T. Frączyk, *Drukarnia Biblioteczna w Puławach*, „Rozprawy i Sprawozdania Muzeum Narodowego w Krakowie" VI, 1960, s. 134–164; H. Tadeusiewicz, *„Motyl" (1828–1831) — warszawskie czasopismo literacko-rozrywkowe*, „Rocznik Historii Czasopiśmiennictwa Polskiego" 1972, nr 3, s. 329–342; J. Pazdur, *Początki polskiego czasopiśmiennictwa technicznego do 1830 roku*, Warszawa 1975; idem, *Polskie czasopiśmiennictwo techniczne okresu od 1831 do ok. 1870 r.*, Warszawa 1976; idem, *Polskie czasopisma poświęcone budownictwu i materiałom budowlanym do 1918 r.* (*studium historyczne*), Warszawa 1980.

[2] D. Heckermann, *Stan badań nad ilustracją polskiej książki drukowanej*, „Rocznik Biblioteki Narodowej" 1965, s. 370–407; A. Banach, *O ilustracji*, Kraków 1950; idem, *Polska książka ilustrowana 1800–1900*, Kraków 1959; J. Wiercińska, *Sztuka i książka*, Warszawa 1986; J. Sowiński, *Polskie drukarstwo. Historia drukowania typograficznego i sztuki typograficznej w Polsce w latach 1473–1939*, Wrocław 1996; A. Kotańska, *Ilustratorzy i drzeworytnicy drugiej połowy XIX w. Na marginesie katalogu drzeworytów o tematyce warszawskiej*, „Almanach Muzealny" 1, 1977, s. 85–116; E. Łomnicka-Żakowska, *Grafika polska XVIII wieku*, Warszawa 2007; M. Quinckenstein, *Grafika prasowa XIX wieku*, Kórnik 2007; A. Rudniewska, *Świątynie polskie w drzeworytach tygodników warszawskich XIX w.*, Warszawa 1993; K. Pijanowska, *Od ilustracji reprodukcyjnej do obiektu muzealnego*, „Acta Universitatis Wratislaviensis. Bibliotekoznawstwo" 2009, s. 63–72.

Opałek, Hanna Natora-Macierewicz)[3]. Only Wiktor Frantz offered a clear differentiation between a journal's layout and its overall graphic design, providing clear explications for both components, as well as put forward a specifically structured research paradigm, which — following subsequent modifications — has consistently been applied by the present Author, while pursuing her research into Polish 19th c. illustrated periodicals. Comprehensive information on respective investigators and the current state of research into this domain are comprised in the introductions to the articles reporting on the subsequent stages of the project's implementation.

Since no study has been published to date on the graphic design in Polish popular-science journals, gaining any insights into its specifics and overall character of popular-science illustrations since the 18th c. required of the investigators mining the foreign language publications for such information, as those had actually served both as a compositional model, and a source of illustrations for their Polish counterparts[4]. In the foreign literature on the subject dealing with popular-science periodicals, which, especially in the 18th c., used to combine quite frequently a *bona fide* academic content with a popular-science one within a single periodical, the graphics issues were tackled either from the publisher's perspective (or the sub-editor's in charge of supervising overall graphic design of a journal), whose task also consisted in maintaining routine relations with the illustrators[5], or the output of individual artists (lithographers, wood engravers) was assessed, in due consideration of their professional associations with respective journals[6]. In both cases, the

[3] P. Smolik, *Książka i czasopismo ilustrowane w Polsce w pierwszej połowie XIX wieku*, „Grafika" 1939, nr 2, s. 7–14; idem, *Złoty wiek polskiej ilustracji w drugiej połowie XIX wieku*, „Grafika" 1939, nr 3–4, s. 7–24; M. Opałek, *Drzeworyt w czasopismach polskich XIX stulecia*, Wrocław 1949; H. Natora-Macierewicz, *Rozwój warszawskiej ilustracji prasowej do początku XX wieku* (*na przykładzie wybranych tygodników ilustrowanych*), „Rocznik Historii Czasopiśmiennictwa Polskiego" 1976, nr 3, s. 271–290.

[4] For instance, i.e. *L'Encyclopédie ou Dictionnaire raisonné des sciences*, *des arts et des métiers*, edited by Denis Diderot and Jean D'Alembert in the years 1751–1766, was addressed at some depth in terms of its educational pertinence, whilst highlighting the role of illustrative materials by John R. Pannabecker in his paper *Diderot*, *the Mechanical Arts*, *and the Encyclopédie. In search of the heritage of technology education*, published in "Journal of Technology Education" (8, 1994, no. 1, pp. 45–57).

[5] Available editorial archives offer an insight into the actual process of establishing a brand-new periodical, as well as help determine the sources of attendant graphics (overall graphic design and illustrative materials). For instance, Marie-Laure Aurenche, the author of the monograph dedicated to "Magasin pittoresque", a French periodical founded by Edouard Charton, devoted a lot of space to discussing the concepts replanted from the English "Penny Magazine" ("PM"), as well as highlighted the differences between the two magazines, consisting in, *inter alia*, overall diversity and the printing space proportions allocated to particular topics addressed in the content of both magazines, and the actual number of illustrations originating from "PM"; see M.-L. Aurenche, *Edouard Charton*..., pp. 161–212.

[6] Remi Blachon in the first part of *La gravure sur bois au XIXe siècle. L'âge du bois debout* entitled *Histoire de la gravure sur bois d'illustration au XIXe siècle*, described the characteristic features of a wood engraving and development of this technique of artistic expression, the

studies focused on the dissemination of scientific content throughout the French, English and German readership, also by way of augmenting it with a diversity of illustrative material.

When press illustrations made with the aid of a wood engraving technique became popular in France, the editors of Polish journals began to make use of the graphic material along with the texts sourced from renowned European illustrated weekly magazines of general character, e.g. "Mosaïque" (1833–1836), "Le magasin pittoresque" (1833–1838), "Musée des Familles" (1833–1900)[7], ("L'illustration") (1843–1944), "Illustrierte Zeitung" (1843–1944), "Die Illustreirte Welt" (1853–1903),

background of Thomas Bewick's invention and overall development of wood engraving in England (London School), with William Blake and Edward Calvert as its prominent representatives. He also devoted a lot of space to discuss the innovators in French wood engraving, i.e. Jean-Louis-Duplat, Louis Bougon, Charles Thompson, as well as the illustrators of the Romanticism period, i.e. Achille Deveria and Henry Monnier, and the Englishmen working in Paris, including John Andrew. Specially noteworthy is the generation of wood engravers plying their trade after 1830, i.e. Godard Fils, Henri Porret, the Lacoste family, Henri Brevière, Andrew-Best-Leloir (in view of their appreciable contribution to the development of illustrated periodicals), also including those who were the frontrunners in the popular-science journals, i.e. *'Réveil. Journal des sciences, de la litterature, des moeurs, theatres et beaux-arts'*, illustrated by Ch. Thompson, making use of the drawings authored by A. Deveria; 'Cabinet de lecture', with illustrations by Henri Porret, based on Henry Monnier's sketches, and other illustrated magazines: *'Le journal des enfans'*, *'La magasin pittoresque'*, *'Le musee des familles'*, *'Mosaïque'*, *'L'illustration'* and post-Romanticist periodicals: *'Journal pour rire'*, *'La seamine des enfants'*, *'Le journal pour tous'* and *'Le tour du monde'*, with illustrations, inter alia, by Daumier and Gustave Doré, Jules Huyot, the Bellenger brothers, Fortuné Méaulle and Auguste Lepére. This part of the book also offers some information on a new generation of wood engravers, such as Henry Brown, as well as brief resumes on the representatives of this artistic technique from some other countries, e.g. Germany, Italy, Spain, Portugal, Switzerland, the Netherlands, Denmark, and the USA. A separate chapter was devoted to the era of G. Doré. This historical outline was brought up all the way to the application of photomechanical technology, which precipitated the decline of wood engraving technique in producing illustrative materials (Daniel Vierge's works for *'Le monde illustre'*. The second part of the book, *'Dictionnaire des graveurs sur bois du XIXe siècle'*, contains concise biographies of the wood engravers. (See R. B l a c h o n, *La gravure sur bois au XIXe siècle. L'âge du bois debout*, preface de P.-J. Rémy, de l'Académie française, Paris 2001).

[7] Franciszek Salezy D m o c h o w s k i, a publisher of "The Home Museum", wrote in the resume of the 52nd issue in 1835: "A most fortunate concept of making use of a made-over invention, i.e. the so-called wood engravings, so as to print any figures along with the text, at a low price, thus counting on a mass readership, spreading in this way some pleasant and useful news, was just taken up by English and French publishers. Such were the beginnings of the «*The Picturesque Magazine*»y over here. Alas, to ensure that such an undertaking would not fail, it needed constant attention and enhancement. Apart from *The Picturesque Magazine* in France, which drew upon the English textual and pictorial resources [sourced from «The Penny Magazine» — footnote by D.K.], two more magazines got established in Paris, [«Musée des familles» — footnote by D.K.] [*The Family Museum*] and [«Mosaïque» — footnote by D.K.], [*The Mosaic*], boasting the same format and price, although not limited to furnishing encyclopaedic news and diverse pictures of animals, plants, churches and buildings. History, Travels, Philosophy, Moral Sciences, Biography, Poetry, and Philosophical Novels also contributed to both extending and appreciably refining their publishing scope. These two magazines

"Die Gartenlaube" (1853–1944), "Le monde illustré" (1857–1940; 1945–1956), but also from the academic periodicals, as well as the ones popularising science and technology, including American and English periodicals, popular sources of content for the European weekly journals, e.g. ("Nature") (1869–), "Science" (1880–) and "The Scientific American" (1845–), "Scientific News for General Readers. A popular illustrated weekly journal of science" (1887), "Le Génie Civil. Revue générale des industries françaises et étrangères" (1880–1942), "Engineering" (1865–1908), as well as the periodicals publishing reports from the journeys od discovery ("Le tour du monde" (1860–1914), which contracted out the most outstanding cartoonists and engravers of that time[8]. Graphic material regarding mechanical structures was obtained from popular-science and professional periodicals, e.g. "The Practical Mechanic and Engineer's Magazine" (Glasgow 1842), "Appletons' Mechanics Magazine and Engineers' Journal" (New York 1851), "Mechanics' Magazine and Register of Inventions and Improvements" (New York 1833).

Methods

At every stage of the research, a content assessment method (both quantitative and qualitative) was employed with regard to the number, artistic technique and the actual subject of the illustrations[9], a critical assessment method (especially with regard to the 18th and 19th c. studies on the illustrated press and the artistic techniques applied in illustrating the periodicals published at the time), as well as the select statistical techniques (descriptive and numerical data structuring)[10], and — to a lesser extent — the typographic method (mainly with regard to the typefaces and sizes of

were taken as a model by the Warsaw publisher of «The Family Museum», from which he actually sourced most of the textual and pictorial materials" (p. 415).

[8] See D. Kamisińska, *„Imaginacja podaje rękę nauce, a ich związku owocem jest oświecenie". Szata graficzna polskich czasopism popularnonaukowych XIX wieku*, „Rocznik Historii Prasy Polskiej" 2017, z. 2, s. 45–53 and eadem, *Układ graficzny polskich czasopism popularnonaukowych XIX wieku…*, s. 20–22.

[9] *Content Analysis. An Introduction to its Methodologies* (Beverly Hills–London 1980), a methodological guide by Klaus Krippendorff, proved quite helpful in selecting the methods of content assessment, also the graphic one, in the periodicals, especially the recommendation regarding the logical planning of research, the research process itself, and the ways of presenting the collected data, with a view to their long-term use, both for comparison purposes and further research ventures (also guidelines and suggestions to other researchers), to be pursued as a follow-up to the already secured findings (*Introduction* p. 1–7; Chapter 2: *Conceptual Foundation* p. 24–48; Chapter 10.5: *Images*, *Portrayals*, *Semantic Nodes and Profiles* p. 199–203).

[10] J. Pieter, *Zarys metodologii pracy naukowej*, Warszawa 1975.

the fonts in relation to overall appearance of a column of newsprint and respective illustration techniques)[11].

A general categorisation of the illustrative material under study was introduced, in due consideration of the actual subject matter it dealt with, i.e. I. Portrait studies, characters, and conversation pieces, II. Landscapes, III. Decorative and applied arts, IV. Fauna, flora, hunting scenes, V. Personifications, allegories, emblems, and fantasy, VI. History of the world[12]. This categorisation pertains mainly to the actual ways of depicting specific scenes and objects in the illustrations. These are universal, characteristic of the illustrations published in the magazines of every type, whereas with regard to the scope of the present study, the actual purpose of this comparison consisted merely in determining whether a specific type of graphic representation clearly intent on popularising science was to be found there or not.

With a view to effectively categorizing detailed thematic areas addressed within the specific academic disciplines in the illustrations comprised in the set of Polish 18th c. periodicals under study, the typology put forward by the French Scientific Society was adopted[13]. Equally detailed thematic categorisation of the illustrations originating in the 19th c. periodicals was assumed, in line with the organisational structure of respective faculties and departments in the seats of higher learning operating in Poland at the time. The rationale was that since this classification comprised the academic disciplines in the study syllabus, it was consequently assumed that young people's interests may indirectly have spawned such interest in mathematical-natural sciences, medical ones, and in the fine arts, within the society at large.

A detailed thematic typology of the illustrations encountered throughout the 20th c. periodicals (until 1939) was based on the OECD division of academic areas currently in place (a selection), in due consideration of all academic disciplines pursued at that time[14]. All pertinent data are tabularised, in line with applicable data organisation paradigm[15].

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[11] A. Kocot, *Zagadnienie kształtu typograficznego w badaniach dawnej książki*, „Terminus" t. 15, 2013, z. 2, s. 151–165; H. Bułhak, *Metoda typograficzna w badaniach nad dawną książką*, „Biuletyn Poligraficzny" 1977, nr 2, s. 37–52.

[12] K. Krużel, *Wśród starych rycin. Wybrane zagadnienia opracowania formalnego dawnej grafiki*, Kraków 1999, s. 44.

[13] Zob. *Paryż uważany co do nauk*, [w] Roku 1811, w miesiącu styczniu, Warszawa 1811.

[14] The OECD list of science and technology disciplines, i.e. life sciences, engineering and engineering sciences, medical and health sciences, agricultural sciences, social sciences, humanities. Numerous sub-disciplines are also identified within the above-referenced ones. (zob. Narodowe Centrum Badań i Rozwoju, http://www.ncbr.gov.pl/;dostęp: VIII 2017]; also *Rozporządzenie Ministra Nauki i Szkolnictwa Wyższego z dn. 8 sierpnia 2011 ws. obszarów wiedzy*, *dziedzin nauki i sztuki oraz dyscyplin naukowych i artystycznych*, http://isip.sejm.gov.pl/DetailsServlet?id=WDU20111791065 (dostęp: IX 2017).

[15] Wiktor Frantz, while working on developing his research paradigm for daily newspaper graphics, drew particular attention to the difference between the newspaper's overall graphic design and its layout, and consequently, for the need to adopt different criteria for the assessment of press graphic

Results

Implementation of the thematic project "*Graphics in Polish popular-science periodicals*", pursued within the framework of the research venture "*Polish popular-science periodicals published until 1939*"[16] was split into the three respective stages addressing both overall graphic design and respective layout of select Polish popular-science periodicals, as published on Polish lands since the 18th c. until 1939.

Comprehensive research into overall graphic design of Polish popular-science periodicals, as undertaken by the Author, apart from classification and categorisation of its key constituent components, aimed to establish the actual authorship of the illustrations under study, as well as to demonstrate what sort of impact those graphic materials exerted on general readership of those periodicals, their overall visual appeal, and educational value. Making use of the terms *illustration*, *image*, and *representation* throughout the work is meant to draw attention both to the linkage of any such graphic contributions with the actual content of a particular periodical (supplementary informative function), as well as to its independence (i.e. the artist's own way of depicting a specific scope of scientific content) in terms of its overall artistic appeal, otherwise an issue very much within its own right, which in the present assessment was merely touched upon, having been deliberately left over to the art researchers, with a view to being granted due attention and appreciation.

A number of specific periodicals, found representative in terms of overall graphic design and layout, were selected as a research sample. The key selection criteria required that a periodical should comprise some illustrative material and printers' ornaments, as well as boast overall graphic design typical both for its thematic profile and the actual period of its publication. Twelve periodicals were sourced from the 18th c., (out of 19 magazines covered by the research project, i.e. 63% of the periodicals under study at the first stage of project implementation); 19 periodicals represented the 19th c. publishing (out of 50 covered by the project, i.e. 38%), while the research sample representative for the period spanning 1900–1939 was comprised of 19 titles, out of 62 periodicals covered by the third stage of the project, i.e. over 30%.

All in all, 50 titles out of a total of 131 reviewed periodicals were assessed in detail, i.e. 30% of the total. The research project subsequently spawned a number of sizable publications comprising numerical and factual data, as well as preliminary conclusions on the actual significance of press graphics in popular-science periodicals.

materials at large. Overall clarity and pertinence of this approach also prompted the present Author to have it adapted with a view to pursuing a comprehensive study of graphic design in Polish popular-science periodicals. (W. F r a n t z, *Wstępne badania nad szatą graficzną gazety*, „Zeszyty Prasoznawcze" 1963, nr 1–2, s. 44–63).

[16] Narodowe Centrum Nauki, OPUS 8/HS2, ID: 276841.

The paper, focused on reporting the research results originating in the first stage of the project, discusses the findings yielded by the assessment of the 12 select 18th c. periodicals, classified, in line with the definition put forward by Grażyna Wrona, as Polish popular-science periodicals[17]. The following titles were addressed: "Nowe Wiadomości Ekonomiczne i Uczone" [*The New Economic and Scientific News*] (Warszawa 1758–1761), "Uwagi Tygodniowe Warszawskie" [*The Warsaw Weekly Notes*] (Warszawa 1768–1769), "Wybór Wiadomości Gospodarskich" [*The Selection of Farming News*] (Warszawa 1770), "Zbiór Różnego Rodzaju Wiadomości" [*The Collection of Mixed News*] (Warszawa 1770), "Historia Polityczna Państw Starożytnych" [*The Political History of Antiquity*] (Warszawa 1772), "Pamiętnik Polityczny i Historyczny [*The Political and Historical Diary*] (Warszawa 1782–1792), "Magazyn Warszawski" [*The Warsaw Magazine*] (Warszawa 1784–1786), "Zbiór Tygodniowy Wiadomości Uczonych" [*The Weekly Collection of Scholarly News*] (Kraków 1784–1785) "Polak Patriota" [*The Polish Patriot*] (Warszawa 1785–1786), "Zabawy Obywatelskie" [*The Civic Games*] (Warszawa 1792–1793), "Dziennik Uniwersalny" [*The Popular Daily*] (Warszawa1794), "Praktyka Lekarska" [*The Doctor's Practice*] (Warszawa 1795).

The Author managed to establish that the first Polish periodicals making use of illustrative material for science popularisation purposes appeared in the late 18th c., published mainly in Warsaw. Admittedly, the actual lifespan of individual titles was not long, nevertheless they indubitably gave the necessary impulse to prospective prosperity of such periodicals in the 19th c. Both the encyclopaedic publications, as well as popular French or English periodicals, developing around at the same time, were looked upon as the actual models for the ones under present study. Besides, both the content and the graphic material were also sourced from them. Polish periodicals made use of the graphic layout typical of the publications released in a book format, as well as of the printing materials widespread throughout Europe at the time.

The paper used for printing originated both from abroad, and from the Polish paper mill in Jeziorna, recognizable by the paper mill's filigree. Periodicals were printed in the longitudinal 8º and 4º format. In the late 18th c. manual typesetting was used. The periodicals under study were characterized by the typesetting and text makeup typical for an 18th century book, preserving the space and proportions of certain column components (vignettes, initials, page numbering, footnotes, ordinal markings for the successive sections, headings, and printers' ornaments).

[17] The present Author deems popular-science periodicals to be the ones comprising general and special-focus content, aimed at reporting the advances of science, their practical implementation in daily life, dedicated to inspiring popular interest in the work of any hands-on scientists. These periodicals are primarily intended for a wide range of non-specialists, or just keen enthusiasts of specific academic disciplines (za: G. W r o n a, *Polskie czasopisma naukowe w latach 1918–1939*, Kraków 2005, s. 9).

In the single-sectioned columns the indentations and a division into paragraphs were used, along with the inset tables and sketches. Typical printers' ornaments, along with the fonts, were imported from France and the Netherlands, although since 1772 they were also supplied by Adam Gieryk Podebrański's foundry in Warsaw, and since 1777 — by Paweł Zawadzki's typeface casting shop. Copperplate illustrations, located on the separate pages, often as *bona fide* centrefolds, as offered by "Uwagi Tygodniowe Warszawskie" [*The Warsaw Weekly Notes*] and "Wybór Ekonomicznych Wiadomości" [*The Selection of Economic News*] and "Pamiętnik Polityczny i Historyczny" [*The Political and Historical Diary*] and "Magazyn Warszawski" [*The Warsaw Magazine*] actually made up essential supplementary and explanatory components for the periodicals' textual content[18].

The second stage of the project was rounded up with two publications, the first one dealing with the results of research completed on the 19th c. periodicals. Its scope covered the following titles: "Dziennik Podróży Lądowych i Morskich" [*The Diary of Overland and Maritime Travel*] (1827), "Kolumb" [*Columbus*] (1828–1829), "Skarbiec dla Dzieci" [*Treasure Throve for Children*] (1830), "Przyjaciel Ludu" [*The People's Friend*] (1834–1849), "Magazyn Powszechny" [*The Popular Magazine*] (1834–1844), "Magazyn dla Dzieci" [*The Children's Magazine*] (1835–1836), "Muzeum Domowe" [*The Home Museum*] (1835–1837 and 1838–1839), "Nowy Kolumb" [*The New Columbus*] (1839), "Księga Świata" [*The Book of the World*] (1851–1863), "Przyroda i Przemysł" [*Nature and Industry*] (1856–1858), "Skarbczyk Domowy" [*The Home Treasure Throve*] (1863), "Wędrowiec" [*The Rambler*] (1863–1906), "Odczyty Popularne z Nauk Przyrodniczych i Ekonomiczno-Społecznych dla Rzemieślników i Przemysłowców" [*Popular Readings from Life Sciences and Economic and Social Sciences for Craftsmen and Industrialists*] (1865)[19], "Przyrodnik" [*The Naturalist*] (1871–1873), "Przyroda i Przemysł" [*Nature and Industry*] (1872–1881), "Świat" [*The World*] (1876–1881), "Zdrowie" 1877/78–1879/80), "Przyrodnik" [*The Naturalist*] (1879–1887) and "Wszechświat" [*The Universe*] (1882–1914).

It was established that in terms of their graphic layout, the 19th c. popular-science periodicals differed mainly with regard to the newsprint. As of the middle 19th c., all of them made use of cheap newsprint only. The actual format of periodicals more than doubled, which must have originated through the typesetting of illustrations together with the textual content, whereas by the end of the century traditionally

[18] More on this topic to be found in: D. Kamisińska, *Grafika polskich czasopism popularnonaukowych XVIII wieku…*, s. 5–56.

[19] Although a popular-science character of this periodical does not seem all that obvious (14 volumes of 15–32 pages each were published, each with its own pagination and inset wood engravings; comprising assorted write-ups on social economy, chemistry, physics, human anatomy and physiology), it was admitted as a study sample material for critical assessment of graphic materials, in view of the anatomical drawings it comprised, rather seldom encountered in Polish popular-science periodicals in the mid-19th century.

manual typesetting was replaced by machine (hot metal) line casting made on the linotypes. The arrival of colour printing inks by the end of the century made it possible to have the full-colour illustrations printed out. General composition of a single printing column was also substantially altered, as it evolved into a double-column layout (with a vertical dividing line down the middle), whereas the use of printers' ornaments was reduced, which contributed to overall clarity of the layout by way of allowing more "air" into the printed text, while also widening the margins.

The double-lined titles of individual texts, typeset in a variety of fonts of different point-sizes and shapes, optically counterbalanced the long columns of text, while the illustrations inset (spaced out throughout) in different sections of the columns enhanced overall visual appeal of a periodical. At the time, this was a common enough trend among the editors, so the periodicals under study did not really stand apart in terms of their overall aesthetic appeal from the ones of different profiles, nor indeed from any of their European counterparts[20].

The second article deals with overall graphic design of the 19th c. popular-science periodicals. All pertinent research data are tabularised, and also enclosed with exemplary illustrations. It was inferred on the basis of the tabularised data that in terms of overall graphic design Polish popular-science periodicals very much imitated the style of their European counterparts. All of them were printed out with the aid of a typographic printing press, gradually replaced by a rotary printing machinery, both on handmade paper and newsprint, making use of the Antiqua typeface.

They had a manually typeset block of print (by the end of the century a machine-made one, laid out into a single- or a double-column block of text, initially in a format directly evocative of the 18th c. periodicals, eventually stabilised into the 19 cm wide and 28 cm high format by the middle of the 19th c., augmented with typical printers' ornamentation material. They were distinguishable by the illustrations rendered in various techniques, i.e. copperplates, steel engravings, lithographs, wood engravings, photographs, ordered mostly in German graphic companies (lithographs were imported from F. Silber in Berlin; steel engravings were made by Verlag von Gottlieb Haase Söhne from Prague, and the steel gravers, i.e. L. Zechmayer, W. Kandler, T. Hyrtl), or purchased along with the textual materials from French and German publishers ("Wędrowiec" [*The Rambler*] purchased them from Paris-based Hachette publishing house).

Less affluent editorial offices used illustrative materials developed by local artists (lithographed for "Przyjaciel Ludu" [*The People's Friend*] by Teofil Mielcarzewicz) or even took on some lithographers on their editorial staff, like the Puławy-based "Skarbiec dla Dzieci" [*Treasure Throve for Children*]. Illustrations authored by eminent European cartoonists (Gustave Dorè, George Cruikshank) were highly artistic,

[20] More on this topic to be found in: D. Kamisińska, *Układ graficzny polskich czasopism popularnonaukowych XIX wieku...*, s. 5–37.

consequently raising a respective journal's stature, enhancing its overall visual appeal, and boosting its educational impact. It is quite likely that their multidisciplinary character, closely related to the issues addressed by the articles, were instrumental in broadening their readership, not least by pulling in the recipients of easily digestible scientific knowledge and attractive visualisations of practical applications for the brand-new technological advancements, even though a specifically targeted research project would obviously be required to have this speculative supposition credibly corroborated.

Highly realistic renditions of pictorial representations (illustrations), combined with their high technical quality (except for poor quality photographs) was conducive to high legibility of the printed images. Taking good care of a respective journal's visual appeal, despite substantial costs incurred through purchasing a diversity of illustrations, was in fact a well-conceived strategy on the part of the editors, clearly aimed at popularising science, whilst also refining the taste of their readership. It might therefore be asserted beyond a reasonable doubt that graphic content in Polish popular-science periodicals must appreciably have aided their development throughout the 19th c.

The third stage of the project covered the assessment of select 19 periodicals published in the years 1900–1939, i.e. "Ziemia" [*The Planet Earth*] (1910–1950), "Orli Lot" [*The Eagle's Flight*] (1920–1950), "Urania" (1922–), "Przyroda i Technika" [*Nature and Technology*] (1922–1939), "Przyrodnik" [*The Naturalist*] (1924–1926), "Higiena Ciała" [*Bodily Hygiene*] (1925–1928), "Wiedza i Życie" [*Knowledge and Life*] (1926–), "Z Otchłani Wieków" [*From the Treasure Throve of History*] (1926–), "Czasopismo Przyrodnicze" [*The Nature Magazine*] (1927–1939), "Wynalazki i Odkrycia" [*Inventions and Discoveries*] (1927), "Filomata" [*The Lover of Science*] (1929–1939), "Wiedza i Wynalazczość" [*Knowledge and Inventiveness*] (1931), "Wiadomości Ludoznawcze" [*The Anthropology Newsletter*] (1932–1934), "Kółko Przyrodnicze" [*Nature Special-interest Group*] (1932–1939), "Dla Zdrowia" [*With Health in Mind*] (1934–1939), "Przemysł i Wynalazki" [*The Industry and Inventions*] (1935), "Młody Przyrodnik" [*The Young Naturalist*] (1937–1939), "Młody Przyjaciel Zwierząt" [*The Young Animals' Friend*] (1937–1939), "Na Drogach Wiedzy" [*Along the Pathways to Knowledge*] (1939). It was established that the periodicals under study appreciably reduced their format. In terms of printing composition, the pages of Polish popular-science journals published in the first decade of the 20th c., represented by "Ziemia" [*The Planet Earth*] in the present study sample, were in their appearance very much reminiscent of those published in the previous century, boasting a double column block of print, with a decorative title vignette on top, even though it was already on the wane.

Excessive printers' ornaments (especially borders and dingbats) in "Ziemia" [*The Planet Earth*], even though originally designed especially for this magazine by an artist, clearly evocative of folk inspiration, gave the impression of overcrowding

and disharmony. Its pages, interspersed with very few, rather blurred photographs, hardly improved the magazine's overall aesthetic appeal. Periodicals published in the second decade of the 20th c. (10 titles in the study sample), mostly boasted the two-column blocks of print, and were already purged of printers' ornaments (although in "Higiena Ciała i Sport" [*Bodily Hygiene and Sports*] some fancy dingbats still prevailed), while the title vignettes were abandoned in favour of the covers, as in "Filomata" [*The Lover of Science*], "Wiedzy i Życie" [*Knowledge and Life*], "Koło Przyrodnicze" [*Nature Special-interest Group*], "Czasopiśmie Przyrodnicze" [*The Nature Magazine*], "W Wynalazkach i Odkryciach" [*Inventions and Discoveries*], "Wiedzy i Wynalazczości" [*Knowledge and Inventiveness*], "Przemysł i Wynalazki" [*The Industry and Inventions*], "Przyroda i Technice" [*Nature and Technology*]. The editors of periodicals published in the third decade of the century (8 titles in the study sample) made use of both a single or double-column print blocks (inclusive of a horizontal split across the width of the column), ordered original vignettes for their respective thematic sections, and assorted dingbats of floral character (e.g. "Koło Przyrodnicze" [*Nature Special-interest Group*] and "Młody Przyjaciel Zwierząt" [*The Young Animals' Friend*]).

Periodicals were typeset and printed out on ordinary newsprint, whilst making use of the Antiqua typeface. Reproductions of oil paintings addressing nature at large ("Przyrodnik" [*The Naturalist*]) were printed on separate sheets of chalk paper. As far as the illustrative material was concerned, it was provided almost exclusively by the authors of textual material in the form of various technical-quality photographs, occasionally accompanied by sketches and contour maps. "Przyrodnik" [*The Naturalist*] published various wood engravings well-anchored in natural imagery. Some magazines were virtually swamped with barely legible photographs, rather haphazardly placed throughout the textual material. Despite multi-thematic character of all published graphic material, including the technical type of illustrations for reference purposes, the magazines of this period seemed appreciably inferior in terms of their overall visual appeal, when compared to their top 19th c. counterparts.

Popular-science character of illustrative material in the periodicals

Popularization of science and technology through graphics consisted in presenting the issues dealt with by particular disciplines, visualisation of machinery and equipment, and the production processes. This type of message was easily comprehensible for non-specialists, and universal in character, i.e. illustrations furnished by the same authors, addressing the same subject, were printed in the magazines published simultaneously in many European countries. Visual representations were

the first ones to reach out to the readers of any magazine. Frequently, the graphic material proved the only message that actually got through, as some readers never bothered to read the accompanying articles. Apart from static structures of some temples, the illustrations might well depict dynamic scenes in some far-flung, exotic locations, or show daily work in a glass mill, for example. When offered in this form, they proved of appreciable interest to the viewer, and if he happened to be literate, he might well be tempted to read the accompanying text.

Initially, the illustrations served as a sort of a follow-up, supplement, and possibly also a development of the 18th c. public experimental demonstrations, and various open lectures. Throughout the 19th c., they made integral, constituent components of the articles, and their role was supplementary, explanatory in relation to the main content. The reader's attention was first captured by the image, then he would move on to the text in search of explanations. Incorporation of technical drawings and photographs containing visual information into the periodicals made it appreciably easier for the reader to make sense of the actual message comprised in a specific article, and therefore inspire his interest at the issue at hand. In a way, the illustrations allowed the reader to steal a peek into the scientist's realm, and appreciate the results of his research and creativity at first hand, as it were.

The basic task the editors of periodicals assigned to themselves, as well as to their contributing authors, mostly the actual scientists, talked somehow into getting involved in the popularisation of science and technology venture, was to inspire enthusiasm for science in schoolchildren, encourage them to pursue their own studies, and search out for a more serious reading matter, also by indicating the sources of pertinent texts and illustrations. The actual selection of the issues, published in the popular-science journals in view of their topicality, overall significance, and originality, was instrumental in directing the readers' interests toward the more outward-looking topics, opening up their intellectual horizons, and stimulating independent, critical thinking.

Following the period of offering reprints of foreign articles by the editors of Polish periodicals (until the end of the 19th c.), which dealt manly with reporting the world's scientific advancements, Polish authors developed their own style and an effective way of reaching out to the readers of all ages with a more intellectually demanding content. Illustrations became *bona fide* components of the articles, highlighting the actual significance of the topics addressed in them, while in view of their complex character, requiring of a potential reader more mental effort and commitment so as to be in a position to effectively comprehend the novel content.

Separation of purely technical illustrative material for further assessment from the one merely popularising various academic areas seemed well justified, primarily in view of significant achievements of Polish scientists and engineers in the field of applied and technical sciences, especially in the interwar period. This was reflected in topical, well-written articles that brought the reader much closer to fully appre-

ciate the actual impact of those advances. It should be highlighted at this juncture that the illustrative material at issue was developed by the authors themselves, who boasted adequate education, were highly proficient in their own area of expertise, treated their readers with due respect, and were genuinely keen on popularising those achievements.

Illustrative material was meant to support education of the general public and inspire interest in the advances of science and applications of technological inventions (in the interwar period, they raised public awareness on dynamic development of Polish science and technology in the wake of the country's regained independence). Illustrations made popular-science periodicals visually appreciably more attractive, generally pandering to popular demand for rich pictorial content, which seemed quite a fad at the time. Drawings made by the scholars proficient in a particular area of academic expertise were professionally rendered, as well as ensured reliable representation of the subject matter at issue, even though they were actually intended for popular-science periodicals. They made it possible to have the development of technology rendered in the drawings effectively compared with the technological advances depicted in subsequent decades within the same, or a different periodical. (It happened occasionally, though, that the very same pictorial material was published either in the same, or in a different periodical many years later, whilst illustrating a completely different type of article).

The illustrative materials got the readers used to a specifically structured type of content that was there over the years, regularly augmented with the anticipated illustrations, as they had always been heralded either in the previous issues, or in the prospectus for the following year. For today's researchers into science and technological development, all backdated issues of popular-science journals make a virtual treasure trove of high value research material. The gears depicted in the illustrations by Stanisław Solski, as commissioned by "Architekt polski" [*The Polish Architect*] published in "Dziennik Ekonomiczny Zamoyski" [*The Zomosc Commercial Daily*], accompanying the lecture conducted by Gaspard-Monge's Lecture on Statics, Franciszek Miechowicz's "Theoryia machin" [*The Theory of Machine Construction*], and in the textbook by Karol Stadtmüller, inspired Krystyna Schabowska and Konrad Pylak to make pertinent calculations, with a view to determining the actual efficiency of these devices.

The key role of any illustrative material comprised in a popular-science periodical consisted in complementing the actual text and offering a sort of an extra, pictorial clarification to it. Depending on the actual subject matter within a specific area of academic expertise, prints and photographs produced in line with a diversity of techniques, offered the reproductions of paintings and crafted artefacts, landscapes, or purely technical visualisations. Due to acutely realistic character of the images, as offered by the wood engravings, authored by eminent 19th c. French artists, they also served as ornaments, making the readership more sensitive in their appreciation of

the arts at large. This particular function somewhat lost its significance with regard to the periodicals published in the period spanning 1918–1939, when wood engravings were replaced by press photography characterised by rather poor technical quality.

In terms of complementing the textual content, assorted illustrative materials proved particularly handy when augmenting the series of reports and academic accounts from various research trips undertaken to as yet undiscovered regions of the Earth. The artists often portrayed the locals and rendered various specimens of fauna and flora described in the reports, as well as a diversity of everyday scenes such as hunting, rural fiestas, rituals, or bullfights. Clearly printed out, frequently on a full page, such illustrations gave some idea of certain „exotic" destinations to those readers for whom embarking on such voyages of discovery was simply non-feasible. By way of offering extra clarifications to the actual texts, a variety of illustrations were used, e.g. the ones depicting physical experiments, technological equipment at work, or a manufacturing line in an industrial plant. The captions referring to individual components of specific machinery, as comprised in the technical drawings, allowed to locate their detailed descriptions in the texts, and thus made it easier for the readers to understand the operational principles of a particular device.

Popular-science periodicals offered a diverse content, both textual and iconographic, novel and inspiring, as well as topical and easily comprehensible to everyone. Popularity of illustrated popular-science periodicals actually underpinned a paramount need for general education within a society at large, in conjunction with individual sense of curiosity, and general readiness to address and absorb a brand-new scope of knowledge on the advances of science and technology, and the potential for successfully applying the most recent technological inventions in everyday life.

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Gallica – La Bibliothèque numérique de la Bibliothèque nationale de France, http://www.bnf.fr/fr/collections_et_services/bibliotheques_numeriques_gallica.html

Linda Hall Library Digital Collection – http://lhldigital.lindahall.org

Dictionaries and encyclopedias, internet archives, databases

Database of Scientific Illustrators 1450–1950, http://www.uni-stuttgart.de

Dictionary of National Biography, London 1885–1900, https://onlinebooks.library.upenn.edu

Encyclopædia Britannica, https://www.britannica.com
Internet Archive, https://archive.org
The Encyclopedia of Diderot & d'Alambert. Collaborative Translation Project, https://quod.lib.umich.edu

Books

Акопов А. И., *Отечественные специальные журналы 1765–1917. Историко-типологический обзор.* Издательство Ростовского Университета 1986, http://jour.vsu.ru

Portals

Agence photographique de la Réunion des Musées Nationaux-Grand Palais, https://www.photo.rmn.fr
Albertina Museum Vienna, http://sammlungenonline.albertina.at
Smithsonian Institution National Museum of Natural History & Global Volcanism Program, http://volcano.si.edu