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## THE DESIGN OF 18<sup>th</sup> CENTURY POLISH POPULAR SCIENCE MAGAZINES<sup>1</sup>

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The article presents the results of research into twelve Polish popular science magazines, published in the 18<sup>th</sup> century in Warsaw and Kraków, which served to distribute the fruits of science and technology from around the world among society. The salient features of the layout and the design of the periodicals are discussed, European prototypes for magazines of this type, and sources of texts and decorative typographic elements are identified, and the importance of graphics in the popularisation of science and learning in magazines is established.

*Keywords:* 18<sup>th</sup> century press design, 18<sup>th</sup> century Polish popular science magazines.

The design of 18<sup>th</sup> century Polish popular science magazines has not yet been examined and written about by historians of the press. One of the reasons for the lack of study in this area could be the overlapping research fields of history of the press and history of art, and the methodological difficulties which arise from this. Another reason was certainly the lack of a consistent definition of a popular science magazine, and also the lack of a holistic approach to both the layout and design of periodicals of this type. Since only a few researchers have pointed to the necessity of taking on this subject matter (M. Opalek regarding illustrated weeklies with a general subject matter, and recently M. Quinkenstein)<sup>2</sup>, complex research papers which would have traced the evolution of the design and the artistic value of the illustrations of various types of magazines published in Polish territories, including in the 19<sup>th</sup> century, have not been undertaken<sup>3</sup>.

Historians of the press have been interested in Polish popular science magazines from the point of view of the evolution of the form and content of periodicals (G. Wrona)<sup>4</sup>, but also in the context of the theoretical issues around the popularisation of science (W. Tyrański,

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<sup>1</sup> This article is a summary of one stage of research which is being carried out as part of the NCN Project *Polskie czasopiśmiennictwo popularnonaukowe do 1939 roku* (Polish popular science magazines up to 1939), planned to be carried out from 2015–2018, under the supervision of dr. hab. Grażyna Wrona, professor of the Pedagogical University in Kraków. Full version of this text (with tables and illustrations) was published in polish language in: *Rocznik Historii Prasy Polskiej*. – 2016. – Z. 3. – S. 5–47.

<sup>2</sup> Opalek M. *Drzeworyt w czasopismach polskich XIX stulecia*. – Wrocław, 1949; Quinkenstein M. *Grafika prasowa XIX wieku*. – Kórnik, 2007.

<sup>3</sup> The design of periodicals has been dealt with as part of the topic of book layout: Heckermann D. Stan badań nad ilustracją polskiej książki drukowanej // *Rocznik Biblioteki Narodowej*. – 1965. – S. 370–407; Natora-Macierewicz H. Rozwój warszawskiej ilustracji prasowej do początku XX wieku (na przykładzie wybranych tygodników ilustrowanych) // *Rocznik Historii Czasopiśmiennictwa Polskiego*. – 1976. – Nr 3. – S. 271–290; Banach A. *Polska książka ilustrowana 1800–1900*. – Kraków, 1959.

<sup>4</sup> Wrona G. Polskie czasopisma popularnonaukowe w XIX wieku. Ewolucja formy i treści // *Rocznik Historii Prasy Polskiej*. – 2007. – Z. 2. – S. 5–21.

W. M. Kolasa)<sup>5</sup>, or in association with research into the history of the press and creating a press bibliography (J. Łojek, J. Myśliński, W. Władyka)<sup>6</sup>. Popular science periodicals have also been researched against the background of the eighteenth century press market, including the European market (D. Sidorowicz, D. Hombek, K. Socha, J. Kurkowski, J. Szczepaniec, J. Łojek, J. Lankau, W. Giełżyński, J. Kasprzyk)<sup>7</sup>, but mostly from the perspective of the subject matter of each magazine (I. Homola-Dzikowska, H. Tadeusiewicz, H. Borkowska)<sup>8</sup>, while difficulties in establishing criteria that would qualify a magazine as a popular science periodical (a lack of a single definition for this type of publication) meant that the phenomenon of popularising science in Polish magazines has not been written up as a synthesis which takes in both the layout and the design, and does the content of the magazines justice.

Since, from the 18<sup>th</sup> century, Polish popular science magazines served to make the knowledge gained in science and technology around the world available to the public<sup>9</sup>, the illustrations, which were very simple at first, served as important sources of explanation and additional information alongside the text. There is no doubt that, in order to assess the evolution of this kind of magazine and its artistic and educational value, it is worth undertaking detailed research into this field.

The article presents the results of research into the layout of twelve magazines, defined as popular science magazines according to Grażyna Wrona's definition<sup>10</sup>. Taking

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<sup>5</sup> Tyrąński W. Polskie czasopisma popularnonaukowe i popularnotechniczne // *Zeszyty Prasoznawcze*. – 1979. – Nr 4. – P. 35–44; Kolasa W. M. Współczesne czasopiśmiennictwo popularnonaukowe // *Rocznik Historii Prasy Polskiej*. – 1998. – Z. 1–2. – S. 143–169.

<sup>6</sup> *Bibliografia prasy polskiej 1661–1831* / oprac. J. Łojek. – Warszawa, 1965; Łojek J., Myśliński J., Władyka W. *Dzieje prasy polskiej*. – Warszawa, 1988.

<sup>7</sup> Sidorowicz D. Kto czytał czasopisma Piotra Świtkowskiego? Świadczenia odbioru // *Czasopismo Zakładu Narodowego Imienia Ossolińskich*. – 2008. – Z. 18/19. – S. 25–37; Eiusdem. Artykuły z niemieckiego miesięcznika *Historisches Portefeuille* (1782–1788) w przekładach polskich na łamach czasopism Piotra Świtkowskiego // *Czasopismo Zakładu Narodowego Imienia Ossolińskich*. – 2001. – Z. 12. – S. 19–33; Eiusdem. Artykuły z *Berlinische Monatsschrift* (1783–1796) na łamach czasopism Piotra Świtkowskiego // *Czasopismo Zakładu Narodowego Imienia Ossolińskich*. – 2002. – Z. 13. – S. 39–61; Hombek D. *Prasa i czasopisma polskie XVIII wieku w perspektywie bibliologicznej*. – Kraków, 2001; Socha K. Prenumeratory „Zbioru Tygodniowego Wiadomości Uczonych” (1784–1785) // *Rocznik Historii Prasy Polskiej*. – 2002. – Z. 2. – S. 45–65; Kurkowski J. *Warszawskie czasopisma uczone doby Augusta III*. – Warszawa, 1994; Szczepaniec J. Monopol prasowy Tadeusza Włodka w Polsce w latach 1793–1796 // *Ze Skarbcza Kultury*. – 1964. – Z. 16. – S. 5–115; Łojek J. *Dziennikarze i prasa w Warszawie w XVIII w.* – Warszawa, 1960; Lankau J. *Prasa staropolska na tle rozwoju prasy w Europie 1513–1729*. – Kraków, 1960; Giełżyński W. *Prasa warszawska 1661–1914*. – Warszawa, 1962; Kasprzyk J. Gdańskie czasopiśmiennictwo naukowe i moralne pierwszej połowy XVIII wieku // *Rocznik Gdański*. – 1968. – T. 27. – S. 33–68.

<sup>8</sup> Homola-Dzikowska I. „*Pamiętnik Historyczno-Polityczny*” Piotra Świtkowskiego 1782–1792. – Kraków, 1960; Homola I. Piotr Świtkowski i jego *Pamiętnik Historyczno-Polityczny* // *Zeszyty Naukowe Uniwersytetu Jagiellońskiego. Historia*. – 1958. – Z. 3. – S. 119–161; Tadeusiewicz H. „*Polak Patriota*” (1785) // *Sprawozdania z Czynności i Posiedzeń*. – Łódź, 1993. – T. 47. – S. 201–209; Tadeusiewicz H. *Polak Patriota* (1785) – charakterystyka czasopisma // *Acta Universitatis Lodzianis. Folia Librorum*. – 1995. – Nr 6. – S. 33–64; Borkowska H. *Magazyn Warszawski Pięknych Nauk Piotra Świtkowskiego 1784–1785* // *Roczniki Biblioteczne*. – 1971. – Z. 1/2. – S. 31–41.

<sup>9</sup> The texts published in the magazines in the study contained references to European academic literature for example, in “*Magazyn Warszawski*” (*The Warsaw Magazine*), there were discussions of the works of the Italian physicist and mathematician Giovanni Alfonso Borelli (1608–1679), who specialised in biomechanics and wrote *De moto animalium*, the English astronomer and natural philosopher William Derham (1657–1753), author of *Physico-theology or a demonstration of the being and attributes of God*, and the Dutch philosopher and mathematician Bernhard Nieuwentijt (1654–1718), author, along with Johann Andreas Segner, of *Het regt gebruik der werelt beschouwingen ter overtuiging van ongodisten en ongelovigen*, and also the English naturalist John Ray (correctly Wray) (1627–1705), author of the two-part *The wisdom of God manifested in the works of the creation* (London, 1691).

<sup>10</sup> The author classifies periodicals with general and specialised content, which aim to pass on information about academic progress and achievements and about how to put them into practice, and to stimulate interest in the work of scholars, as popular science magazines. These magazines are written for a wide range of non-specialists or

into account the layout and design of these periodicals, a modified version of the research model developed by Wiktor Frantz was used<sup>11</sup>.

### 1. The research sample

The following periodicals were analysed, mostly published in Warsaw from 1758–1795: *Nowe Wiadomości Ekonomiczne i Uczone* (Economic and Science News) (1758–1761), *Uwagi Tygodniowe Warszawskie* (Warsaw Weekly Notes) (1768–1769), *Zbiór Różnego Rodzaju Wiadomości* (Various Collected News) (1770), *Wybór Ekonomicznych Wiadomości* (Selected Economic News) (1770), *Historia Polityczna Państw Starożytnych* (The Political History of Ancient Civilisations) (1772), *Pamiętnik Polityczny i Historyczny* (Historical and Political Journal) (1782–1792), *Magazyn Warszawski* (The Warsaw Magazine) (1784–1786), *Zbiór Tygodniowy Wiadomości Uczonych* (Weekly Summary of Scholarly News) (1784–1785), *Polak Patriota* (The Polish Patriot) (1785–1786), *Dziennik Uniwersalny* (The Universal Journal) (1794), *Zabawy Obywatelskie* (Citizens' Games) (1792–1793), *Praktyka Lekarska* (The Practise of Medicine) (1795). These magazines are located in the collections of the Princes Czartoryski Library in Krakow, the Jagiellonian Library, the National Library of Poland, the University Library in Warsaw, and in the following libraries: the Jagiellonian Digital Library, the UMCS Digital Library, the Digital Library of Wielkopolska, and the Lower Silesian Digital Library. *Pamiętnik Polityczny i Historyczny* was the longest running publication for ten years, during which it changed its title twice, although the layout and design remained the same. The remaining periodicals were published for between 1 and 3 years. Jan Ch. Albertrandi firstly edited *Uwagi Tygodniowe Warszawskie* and later *Wybór Ekonomicznych Wiadomości*, while Piotr Świtkowski worked at *Pamiętnik Polityczny i Historyczny*, *Magazyn Warszawski* and *Zabawy Obywatelskie* at more or less the same time. *Wybór Ekonomicznych Wiadomości* and *Historia Polityczna Państw Starożytnych* were printed at the Royal and Republic Collegium Societatis Jesu Printing House, while *Magazyn Warszawski* and *Pamiętnik Polityczny i Historyczny* appeared under the imprint of Michał Gröll, bookseller at the royal court. The latter periodical, due to its ten-year presence on the publishing market, was also printed at the Royal Court Printing House of the XX Piarists, by Piotr Dufour, along with *Polak Patriota*.

The remaining magazines were published at Mitzler's Printing House, at the Privileged Printing House of Ignacy Grebel, the royal typographer and bookseller, at the New Printing House of Piotr Zawadzki, at the printing house that Józef Mejer leased with Jan Ciszewski from Wojciech Krompt, at the (National and Foreign) Correspondent's Printing House and thanks to the investment and efforts of Jan August Poser, the Warsaw bookseller.

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those interested in a particular discipline (Wrona G. *Polskie czasopisma naukowe w latach 1918–1939*. – Kraków, 2005. – S. 9).

<sup>11</sup> According to W. Frantz's typology, the layout of an illustrated weekly is made of up material elements, whereas the design is composed of structural elements, permanent and variable. Therefore, the analysis will include the paper, format, composition, printing and ink, and also the layout of the printed page and the illustrations. Although this research model was developed to analyse the design of the contemporary daily press, the author of this article has used it, with additions, in research into periodicals from the second half of the 19<sup>th</sup> century: Kamisińska D. Grafika polskich tygodników ilustrowanych drugiej połowy XIX wieku na przykładzie lwowskiego "Ogniska Domowego" (1883–1888) i "Strzechy" (1868–1873) oraz krakowskiego "Świata" (1888–1892 i 1893–1895) i "Włościanina" (1869–1879) // *Rocznik Historii Prasy Polskiej*. – 2015. – Z. 3. – S. 39–73; Kamisińska D. Grafika polskich tygodników ilustrowanych dla dzieci w drugiej połowie XIX wieku na przykładzie warszawskiego, lwowskiego i poznańskiego "Przyjaciela Dzieci" // *Annales Universitatis Paedagogicae Cracoviensis. Studia ad Bibliothecarum Scientiam Pertinentia*. – 2015. – T. 13. – S. 15–51; Kamisińska D. Dessiné et grave... Francuskie drzeworyty w polskich tygodnikach ilustrowanych XIX w. na przykładzie tygodnika "Wędrowiec" (part I) // *Toruńskie Studia Bibliologiczne*. – 2014. – Nr 2. – S. 9–36; 2015. – Nr 1. – S. 9–48.

## 2. The graphic layout of the magazines in the study

According to W. Frantz's suggestion for research, graphic layout includes the type of paper used for printing and its features, its format, the layout of the page, the printing techniques and the type of ink.

### Paper

In the research, the paper is analysed in terms of type (typology by structure), structural-dimensional properties, durability, optical, hydrophobic and special properties. In the second half of the 18<sup>th</sup> century, the types of paper most frequently used for printing were handmade paper and tissue paper. Depending on the year of production, the paper also varies in terms of its basis weight in g/m<sup>2</sup> (weight in grams of one square metre of paper), volumetric weight (a measure of the paper's density given in g/m<sup>3</sup>), the level of adhesiveness (a measure of resistance to the penetration of liquid, such as ink), smoothness (the level of porosity, roughness<sup>12</sup>), breaking length (the length at which the paper will tear due to its own weight at the point of attachment, expressed in metres) and the level of impurities (known as mottling – the amount of impurities of various sizes in 1 m<sup>2</sup>)<sup>13</sup>. The magazines discussed in this article were printed on unsized handmade paper (waterleaf), mostly made from pulp produced from rag without fillers, smoothed, with distinct ridges (marks made by the connecting vertical wires along the line of the edges of the papermaking mould) and ribs (marks left by the densely packed horizontal wires), most often displaying the paper mill's watermark, and on lower quality "tissue paper" which was poorly sized, with no watermarks (about 25 % of non-serial publications at this time were also printed on tissue paper)<sup>14</sup>. The watermarks which were recognized on the pages of some of the magazines (the emblem of an eagle with the Ciołek coat of arms and the writing JEZORNA or JEZIORNA) indicated that the paper they were printed on came from the Jeziorna paper mill near Warsaw, which existed from 1760 and was managed by Jan Fryderyk Thiess from 1778–1793<sup>15</sup>. It produced high quality paper, which was good competition for paper imported from abroad. *Polak Patriota*, *Wybór Ekonomicznych Wiadomości* and probably *Pamiętnik Polityczny i Historyczny* were printed on paper from Jeziorna (on the latter, a watermark in the shape of the letter B was identified, which appeared alongside the letters S, JH or IK, and also a part of an unidentified drawing, perhaps an eagle). *Wybór Ekonomicznych Wiadomości*, on the

<sup>12</sup> This property is measured using the BEKK method, which records the time which it takes to travel 10 cm<sup>3</sup> of air between the head of the device and the paper, at a given pressure. In this method, the paper is rougher if the time taken is shorter, and smoother, when the time is longer. The results of the measurement are given in seconds. See: Goyal H. *Paper on Web* [online] <http://www.paperonweb.com/index.htm> – page available in March 2016.

<sup>13</sup> Siniarska-Czaplicka J. *Papiernictwo na ziemiach polskich w latach 1750–1850 // Studia z Dziejów Rzemiosła i Przemysłu*. – 1966. – T. 6. – S. 123–232. As an example, the structural-dimensional, strength and hydrophobic parameters of the concept paper with the Madonna watermark, produced in Poland in 1792 are not very different from a similar kind of foreign paper from 1782. The parameters of the foreign concept paper are given in square brackets: basis weight 66,4 g/m<sup>2</sup> [70,4 g/m<sup>2</sup>], thickness 0,113 mm [0,121 mm], volumetric weight 0,589 g/m<sup>3</sup> [0,581 g/m<sup>3</sup>], degree of sizing 0,75 mm [0,75 mm], smoothness 17,1 seconds [29,1 seconds]

<sup>14</sup> Siniarska-Czaplicka J. *Papier narzędziem badań księgoznawczych // Studia o Książce*. – Wrocław, 1970. – S. 82–83.

<sup>15</sup> Jadwiga Siniarska-Czaplicka has written a history of this paper mill and a catalogue of the watermark it used. See: Siniarska-Czaplicka J. *Znaki wodne papierni Mazowsza: 1750–1850*. – Łódź, 1960; Eiusdem. *Filigrany papierni położonych na obszarze Rzeczypospolitej Polskiej od początku XVI do połowy XVIII wieku*. – Wrocław, 1969; Eiusdem. *Działalność produkcyjna papierni w Jeziornie w latach 1760–1939*. – Warszawa, 1973. Józef Szczepaniec has also given full information, supported by original research and a subject bibliography, on the subject of the origins of the paper used at that time for printing in Polish territories in his book: *Szczepaniec J. Drukarnia Wolna Jana Potockiego w Warszawie 1788–1792*. – Wrocław, 1998.

other hand, might have been printed on paper from an unknown Prussian paper mill (in this case a watermark with the letters JWM was identified, and a part of a drawing, most likely the Madonna). It is possible, however, that the letter W was in fact a Z, and in that case, it would be paper from Jeziornia, which also used a Madonna watermark, along with the letters JZM.

According to Jadwiga Siniarska-Czaplicka, interpreting the watermarks on printed material does not indicate where the paper came from for certain, because the pages have a small format, are bound together tightly, and/or sometimes cut off by the bookbinder<sup>16</sup>. 70 % of the paper on which Warsaw periodicals from the second half of the 19<sup>th</sup> century was printed was obtained from within the borders of the First Polish Republic. In the opinion of J. Siniarska-Czaplicka, about 70 % of the periodicals published at the time were printed on inferior quality paper, and only a small percentage on “very good” paper. 60 % of magazines published by M. De Kolof and all the titles published by Jan Potocki’s Free Printing House, 50 % of periodicals published by P. Zawadzki and P. Dufour, and over 40 % of M. Gröll’s magazines were printed on “good” paper<sup>17</sup>.

### Format

All the magazines in the study were published in a rectangular format. Nine of the twelve were issued in 8° (*Nowe Wiadomości Ekonomiczne i Uczone, Pamiętnik Polityczny i Historyczny, Zbiór Tygodniowy Wiadomości Uczonych, Polak Patriota, Zbiór Różnego Rodzaju Wiadomości, Zabawy Obywatelskie, Magazyn Warszawski, Dziennik Uniwersalny and Praktyka Lekarska*). Three were issued in 4° (*Uwagi Tygodniowe Warszawskie, Wybór Ekonomicznych Wiadomości, Historia Polityczna Państw Starożytnych*).

### Layout of the page

In the second half of the 18<sup>th</sup> century, typesetting was done by hand. The magazines in the study are characterized by a layout that is typical of 18<sup>th</sup> century books, where space was left and the proportion of each element of the printed area was maintained (mastheads, initials, page numbers, footnotes, organisational signs: catchwords and ordering symbols, texts with titles and plates). In a single-column page, indentations and paragraph breaks were used, and tables and diagrammatic sketches were included in the layout. A small number of copperplate illustrations were placed on separate pages, sometimes double pages. Typical decorative elements and fonts were imported from France<sup>18</sup> and Holland, but from 1772 they were also supplied by Adam Gieryk Podebrański’s Warsaw foundry<sup>19</sup>, and from 1777 Paweł Zawadzki’s. According to a list published in *Dziennik Handlowy*, Zawadzki supplied Gröll, Dufour and Grebel’s printing houses with sets “of a political and lesser character”, “upper and lower case scholastic antiqua” as well as italics and garamonds<sup>20</sup>.

<sup>16</sup> Siniarska-Czaplicka J. *Znaki wodne papierni Mazowsza...* – S. 15.

<sup>17</sup> Siniarska-Czaplicka J. Papier druków Mazowsza i Podlasia XVI–XVIII w // *Kwartalnik Historii Kultury Materialnej*. – 1977. – T. 25, nr 2. – S. 217–242.

<sup>18</sup> Pierre-Simon Fournier put font models and decorative elements of his own design into his two-volume *Manuel typographique utile aux gens de lettres*, published in Paris in 1764–1765. The popularity of Didot’s antiqua is demonstrated by the fact that in 1802, Tadeusz Mostowski bought modern French presses and three new sets of fonts for his printing house nr 646 on Nowolipie Street in Warsaw from Didot’s Parisian foundry and Breitkopf from Lipsk. See: *Wzory różnych pism w drukarni nr 646 przy Nowolipiu w Warszawie*. – Warszawa, 1803.

<sup>19</sup> See: Szczepaniec J. Drukarnia i księgarnia Piotra Dufoura w Warszawie w latach 1774–1796 // *Sprawozdania Wrocławskiego Towarzystwa Naukowego*. – 1966. – Seria A, t. 19. – S. 20–22, and: Eiusdem. Drukarnia Mitzlerowska Korpusu Kadetów w Warszawie w latach 1778–1783 // *Roczniki Biblioteczne*. – 1958. – S. 51–94.

<sup>20</sup> See: *Dziennik Handlowy*. – 1787. – Cz. IX. – S. 497–503.

### *Printing and ink*

Of the twelve magazines in the study, only one was published in Krakow – the other eleven in Warsaw. All of the publications were printed on a typographic printing press.

No information about the ink used at that time in Polish printing houses has survived. It must, however, have been good quality ink, because the print is clear, very black and pure, which indicates that the ink came from a factory which used high quality materials: the dye (pigments), binding agent and solvent<sup>21</sup>. Perhaps the ink was bought from the successful German company belonging to Mathias Mittermayer, which was in operation from 1765 near Munich, and sold its products abroad on a license confirmed by the court advisor's stamp. Georg Huber took over the company in 1780 and set up "The Chemical Lithographic Printing House"<sup>22</sup> in co-operation with Alois Senefelder in 1815.

### **3. Graphic design**

Wiktor Frantz suggested that analysis of graphic design should include the specifics of the magazine's pages and columns, the colours and shades of the pages and illustrations, the extent to which one can isolate sections and topical columns, the fixed or variable positioning of articles, and also the type and technique of illustrations and the style of page layout.

The pages of each magazine analysed were composed of one column, and measure from 6,5 to 11,7 cm wide and from 11,7 to 15,5 cm high. Individual copies (signatures, parts, chapters) did not have separate mastheads (on some title pages, a typical printer's decorative element was used as a masthead). The numbering of copies in a volume, similarly to the numbering of pages, was constant. In single copies, there was no publisher's footer or contents page. All the magazines in the study featured typical printing decorations (lines of varying shapes and thicknesses, borders and edging), and in most magazines, footnotes were included on the lower margin of the page. None of the magazines include illustrations on the printed page, but all had organizational signs on the page: catchwords and ordering symbols. The decorative elements used in printing were kept in black, along with other elements on the page. The magazines were not divided into sections, only *Pamiętnik Polityczny i Historyczny* featured sections that re-occurred in every part of the volume: *Niektóre szczególności* (A few particularities) *Drobiazgi* (Trifles) and *Obwieszczenia* (Notices). The timing of texts in each periodical was random, characteristic only of that particular document and different in each issue.

In the twelve magazines studied, there were 15 copperplate illustrations in all, on separate pages, sometimes double pages, and also 6 tables displaying various numerical data (military affairs, agriculture, trade and population statistics). This very small number of illustrations is not surprising, since the magazines were published for too short a time period (from one to ten years) for an ambitious publishing plan to be followed, creating copperplate illustrations was very costly at that time, and the stencils did not last long, because the copper plate was soft. The stencils that were used produced a blurred image, so it was not possible to produce a large number of prints, especially since the printing

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<sup>21</sup> Up to the second half of the 19<sup>th</sup> century ink was made by printers for their own needs, and it was obtained from linseed or hemp oil which had stood for a long time and been boiled, with soot or resin added, which meant it was not of the highest quality, and the print on books of this era is faded or washed out. See: Staniszewski Z. *Estetyka polskiego druku książkowego XVIII wieku // Ze Skarbca Kultury*. – 1960. – Nr 1. – S. 163–164.

<sup>22</sup> From the Hubergroup company history [online] <http://www.mhp.com.pl/index.php/firma/huber-group/> – page accessed in November 2015.

techniques of the day did not enable illustrations to be printed from the copper plate with the text, so the illustrations could only be included in the magazines on separate pages, which were often folded and could get damaged, and it was probably for these reasons that their number was limited – one folded page was placed at the end of a volume of a magazine.

*Nowe Wiadomości Ekonomiczne i Uczone* was the first magazine to include an illustration, in 1757, and it was a whole-page copperplate illustration in the article *Wstęp do gospodarstwa* (An introduction to farming), showing a diagrammatic plan for drying out boggy terrain, with channels marked with letters of the alphabet and explanations in the text. The clear and well-printed picture is found on the reverse of the page – when looking through the magazine, one first sees a blank page, which is the other side of the page with the illustration<sup>23</sup>. Next, *Uwagi Tygodniowe Warszawskie* inserted a separate page to issue number 8 on January 25<sup>th</sup>, 1769, a diagram of a plough. Next, in 1770 in *Wybór Ekonomicznych Wiadomości*, diagrammatic sketches of ground drills appeared on page 16 in the Second Chapter of Book One: *O warstwach ziemi i sposobach poznania ich odmienności* (On soil layers and how to discover the differences between them), a drawing of a machine for clearing land with explanations in the text appeared on p. 125 of the First Chapter of Part Two, *O karczowanie gruntu* (On Clearing Land), and a drawing of drainpipes, along with commentary in the text and information, that the source *Journal Economique de France*, 1765, p. 570 was used, appears on pp. 170–171 of the Fifth Chapter of Part Two, *O wysuszeniu bagnów bez bicia rowów* (On drying out bogs without digging ditches). A sketch of a machine for spreading fertilizer with descriptions of its parts in the text appeared in the Second Chapter of Part Three, *Nawozy z rodzaju kopalnego, a naprzód o ziemi* (On fossil fertilizers, but first on soil), on p. 331, and a diagram of a water pump, also with a description in the text, was featured on p. 376 in the Fifth Chapter of Part Three, *O marglu, a naprzód o poznaniu i dozywaniu onego* (On marl, but first on learning about and finding the same). In *Pamiętnik Polityczny i Historyczny*, 1784, alongside a portrait of Benjamin Franklin at the beginning of Volume 1, two fold-out sheets with tables on were also included, and in the 8<sup>th</sup> issue of the same year, a copperplate by Józef Perli entitled *Planta Konstantinopola po ogniu 1782* (A map of Constantinople after the fire 1782). Two pages with copperplate illustrations were added to the 1878 and 1788 volumes (1787 vol. 1–2, p. 573–575 – ways of forming crop sheafs, as discussed in the text, and at the end of volume 2, 1788 – *Planta Belgradu i Zemlina* [A map of Belgrade and Zemlin]). *Magazyn Warszawski* included four full-page illustrations: a balloon, *Dawnego Niemca* [the German as he once was] (1784, pt. 1), a lightning conductor (1784, pt. 2) and a volcano (1784, pt. 3). *Polak Patriota* included only three tables with data on the division of the Polish army (1785, pt. 5), England's trade (1785, pt. 6) and "The Russian armies as described in the constitution" (1785, pt. 7). Out of twelve magazines, six included illustrations. All of them are legible, well executed and the damage they have sustained (abrasions) is only due to the need for the page to be refolded each time by the reader.

The variety of decorative elements featured in the magazines in the study is striking, and this was also typical of eighteenth century non-serial publications<sup>24</sup>. The decorations that were used as vignettes that opened a text, as breaks between paragraphs within a text, to separate texts or as tailpieces under a text and at the end of a volume – were small works of art created by woodblock printing, designed in France by the well-known artist Jean-

<sup>23</sup> *Nowe Wiadomości Ekonomiczne i Uczone*. – 1759. – Cz. 4. – S. 212.

<sup>24</sup> See: *Ornamentstichsammlung*, Kunstbibliothek – Staatliche Museen zu Berlin und Verbundzentrale des GBV [online] <http://ornamentstichsammlung.gbv.de> – page accessed in April 2016.

Michel Papillon (1698–1776), who also used panoplies in his designs<sup>25</sup>, and rococo designs of architectonic details (for example *rocaille*, also used by Juste Aurèle Meissonnier)<sup>26</sup>, which were full of symbolic references to ancient civilizations (*Il. 1*), for example depictions of the muses with their respective attributes (a flute, a mask, a harp, a pen, a sheet of music) or the personification of time (a winged elder – Kronos with a scythe), wisdom (a woman with a book, an oil lamp and a round shield) and learning (a woman with a globe and compass, next to a boy with a blackboard), which can also be found in the allegoric performances collected by Cesare Ripa in *Iconologia*<sup>27</sup>.



*Il. 1.* A vignette designed by J.-M. Papillon  
(*Traité historique et pratique de la gravure en bois.* – Paris, 1766. – P. 77)

European foundries, including Polish ones, used Papillon's patterns for vignettes and decorative elements until the end of the 19<sup>th</sup> century. On the last page of the seventh part of *Pamiętnik Historyczno-Polityczny* in 1787, a decorative element of this kind was used (although as a mirror image), showing an eagle sitting on a lyre (*Il. 2–3*).



*Il. 2.* Eagle sitting on lyre – end piece  
(*Pamiętnik Historyczno-Polityczny.* – 1787. – T. 3–4, cz. 7. – S. 674)



*Il. 3.* Eagle sitting on lyre – designed by J.-M. Papillon  
(*Traité historique et pratique de la gravure en bois.* – Paris, 1766. – P. 180)

<sup>25</sup> Panoplia, *sing.* panoplium (armature, spolia hostium, from the Greek πανοπλία) – derived from the ancient Greek custom of displaying the weapons of a defeated enemy, as spoils of war and at the same time a symbol of peace, a sculpted, painted or engraved decorative motif, depicting the parts of the armour (usually cold weapons and defensive weapons: shields, swords, armour, helmets, often stylized as Spartan) and ensigns, arranged horizontally and symmetrically around a shield with the owner's coat of arms. Often used in graveside sculptures, among others or on buildings (See: Chilvers I., Osborne H. *Oksfordzki leksykon sztuki.* – Warszawa, 2002. – S. 494).

<sup>26</sup> Papillon J.-M. *Traité historique et pratique de la gravure en bois.* – Paris, 1766. A well-known decorative architectural motif artist at this time was Juste Aurèle Meissonnier, who used the *rocaille* decoration, similar in appearance to a shell or a stylized earlobe in his designs, with the addition from 1750 of a shape which is reminiscent of a "cockereel's comb" or the crest of a wave at sea (See: *Neuvième livre des Oeuvres de J. A. Meissonnier.* – Juste Aurèle Meissonnier, Gabriel Huquier, 1720–1749).

<sup>27</sup> Ripa C. *Iconologia* / przeł. I. Kania. – Kraków, 2004.



The texts of the articles, which were largely summaries of material from abroad on popular science and new technological inventions<sup>28</sup>, were printed as continuous text, with paragraphs, sometimes also with numbered ordering symbols, with line spacing and without, usually in a smaller font on the last page of an issue, probably when the text would not have fit in the publication because of its size. The texts within an issue usually had double-tier headings, were made up of fonts of varying cuts and sizes, and were often separated by decorative printing elements (borders, edging and tailpieces). The accumulation of decorations make the pages, particularly in the small format of the magazines, appear overcrowded, crammed with a variety of printing features. From the upper margin, where the page number would be inserted, sometimes in decorative brackets (e. g. small flowers), to the broad scrolling above the titles of the texts, groups of lines, borders and decorative elements separating the texts, and the tailpieces under the texts, which could take up as much as 1/3 of a page – there was sometimes not enough room for the main text, especially since the margins would also disappear as a result of bookbinders' actions over the years. Despite this, the overall composition of the pages maintains its own harmony and reading these magazines today is not tiring, which is also due to their small format.

#### 4. Authors and topics of the illustrations

The authors of the illustrations have only been confirmed in two cases: Gottfried Daniel Berger (1744–1825), a German copperplate artist, professor at the Academy of Fine Arts (Akademia Sztuk Pięknych), who illustrated medical and biological materials and carried out reproductions of paintings<sup>29</sup>, was the author of the portrait of Benjamin Franklin in *Pamiętnik Historyczny i Polityczny*, whereas Józef Perli (17...–1818), an engraver and producer of playing cards from Vilnius, who engraved mainly copperplate illustrations on religious topics, as well as portraits and illustrations<sup>30</sup>, authored three copperplate illustrations included in *Magazyn Warszawski* and one in *Pamiętnik Polityczno-Historyczny*.

The illustrations were portraits (apart from the portrait of Franklin there was one of “the German as he used to be” dressed in skins and holding a bow), maps of cities (Belgrade, Zemlin and Constantinople), diagrams of devices (a plough, ground drills, water pumps, drainage channels, machines for clearing land and spreading fertilizer), a balloon and drawings of natural phenomena (a volcano) and instructions for forming sheaves from crops in the form of drawings. The labelled parts of the devices and of the cross-section of a volcano cone are discussed in the text of the article. Thus the illustrations served as sources of explanation and additional information alongside the text, which was particularly significant in the case of magazines which distributed the fruits of science and technology, especially since this kind of magazine was only just gaining the awareness of readers, who would be familiar with technical illustrations from illustrated academic treatises, encyclo-

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<sup>28</sup> As an example, in “Nowe Wiadomości Ekonomiczne i Uczone”, in part III on pages 119–133, there is a text entitled *Planta wojowania z Polakami ułożona przez Maurycego Graffa de Saxe* (Plan of warfare with the Poles put together by Maurice, Count of Saxony) with the information that it was “taken from the book called: *Les Rêveries, Ou Mémoires sur l’art. de la guerre*” (See: Saxe M. de, Comte. *Les rêveries ou mémoires sur l’art de la guerre de Maurice Comte de Saxe, Duc de Courlande et de Semigalle, Maréchal-Général des Armes de S.M.T.C. &c. &c. dédiés a messieurs les officiers généraux ...* – Paris, 1757).

<sup>29</sup> Dohme R. Berger Daniel // *Allgemeine Deutsche Biographie*. – Leipzig, 1875. – B. 2. – S. 373.

<sup>30</sup> *Słownik rytowników polskich tudziej obcych w Polsce osiadłych lub czasowo w niej pracujących przez Edwarda Rastawieckiego*. – Poznań, 1886. – S. 234; Łomnicka-Żakowska E. *Grafika polska XVIII wieku*. – Warszawa, 2008. – S. 157.



he was looking at a magazine. The volumes either did not have a magazine title (such as in the case of *Zbiór Różnego Rodzaju Wiadomości*), or, as in the case of *Dziennik Uniwersalny* – only a title, with no numbers, dates or publisher's address.

The artistic value of the illustrations lies in their accurate depiction of what they represent, or in this case, the physical appearance of tools (a plough), machines (a water pump), modes of transport (a balloon) or the topography of cities (Belgrade). Their repetitive nature arose from the production technique, which, on the other hand, was capable of conveying the smallest details clearly, which meant that prints were ideal for illustrating technical texts, and their historic value today is hard to overestimate.

### 5. The popular science nature of the illustrations

The basic function of illustrations accompanying a popular science text is to display and graphically explain to the reader what he has read in the text – the structure of a machine or the unfolding of a physicochemical process, e. g. a volcano eruption. A visualisation of the machine in correct perspective, from various sides and angles, presents its proportions and the basic elements of its structure, gives information about the way it works, how to operate it, or only about the issue, giving a view on it. The illustration plays a complementary role alongside the text. The individual elements of the machine, geological layers or laboratory apparatus used for optical experiments which are labelled on the drawings are discussed in detail in the article. The comprehension of all the visual and textual information depends on the abilities and level of education of the reader.

Since popularisation does not only apply to the technical sciences, popularisation of geography, ethnography, biology and the fine arts takes the form of realistic illustrations of the natural environment, of indigenous tribes from Africa or Australia carried out during research field trips, detailed images of rock layers, geographical maps and topographical plans of cities, sketches of archaeological digs, fine porcelain, sculptures and copies of oil paintings. Chemistry and physics are popularised by sketches of the various stages of laboratory experiments.

In the Polish popular science magazines which were in development from the second half of the 18<sup>th</sup> century, the few technical illustrations played an informational role (they gave information about scientific achievements, engineering inventions and solutions), a cognitive role (they presented the structure of a machine or the stages of a phenomenon) and an educational role (they explained the unfolding of a natural phenomenon, process or the structure of a device).

In order to fulfil the roles and functions listed above, the illustrations had a wide range of topics, alongside an interesting take of the issue discussed in the text. Appropriate page sizes and a refined technique for making the sketches, stencils and prints – ensured by competent, well-educated (including technically) artists and craftsmen specialising in illustration – were helpful in achieving a high degree of readability. Since popular science magazines were aimed at a wide range of readers who were not scientists or engineers, the illustrations included in the issues made the difficult content easier to understand for the growing numbers of readers, including those who could not read. Even though there were only 15 full-page illustrations in the sample of twelve magazines in the study, the presence of even one copperplate illustration in a publication definitely made it more attractive and enhanced its status.

As this type of magazine developed dynamically in the 19<sup>th</sup> century, the illustrations served not only to inform and educate, but also to inspire the reader to carry out his own investigations and to study technical subjects.

## Summary

The first Polish magazines to popularise science and learning appeared in the second half of the 18<sup>th</sup> century and were mainly published in Warsaw. The individual titles did not have a long lifespan, nevertheless they were clearly the start of the full development of this kind of magazine in the 19<sup>th</sup> century. The models for the periodicals discussed here were encyclopaedic publications, as well as French and English popular science publications which were developing at more or less the same time, and which were a source of articles and graphic material.

The article presents the design of the twelve popular science magazines. The juxtaposition of information in the tables indicates that Polish popular science magazines continued the style which was present in the 18<sup>th</sup> century in Europe in terms of layout and design, with a layout that was still typical of books. All of them were printed on typographic presses on handmade paper with antiqua fonts, and had single column pages laid out by hand, similar formats and decorative material. They were distinguished by the inclusion of copperplate illustrations, which bear witness to the wealth of the publishers, but also their awareness that technical drawings supporting the text not only enriched the visual aspect of the publication, but also added to its educational value, which is demonstrated by the example illustrations, which are included here, of new technological solutions and their practical applications. The publishers, Jan Ch. Albertrandi and Piotr Świtkowski, deserve great credit, as the copperplates discussed appeared in the magazines that they published: *Uwagi Tygodniowe Warszawskie*, *Wybór Ekonomicznych Wiadomości*, *Pamiętnik Polityczny i Historyczny* and *Magazyn Warszawski*.

The high technical quality of the copperplate prints means that the pictures are still clear today. By using the explanations in the text, you can learn about the elements of a water pump or land clearing machine, and how they worked. It can be assumed that the dynamic growth of popular science magazines was due to the illustrations, which were included even more readily in the 19<sup>th</sup> century, since they were produced using a new upright wood engraving technique, which enabled the engraving plates to be laid out along with the text, making the process easier and significantly reducing production costs. Copperplate, and later steel plate illustrations were included in magazines for a long time to come, since they allowed the parts of machines and tools to be precisely represented, but in the first half of the 19<sup>th</sup> century, wood engraving took over most visualisation illustrations e. g. technological lines or means of transport, whereas steel plate prints were included in publications such as *Magazyn Powszechny* in 1839 only as an exclusive bonus with views of European cities.

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## ДИЗАЙН ПОЛЬСЬКИХ НАУКОВО-ПОПУЛЯРНИХ ЖУРНАЛІВ XVIII СТОЛІТТЯ

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Стаття представляє результати досліджень дванадцяти польських науково-популярних журналів, які виходили у XVIII столітті у Варшаві та Кракові, що були покликані поширювати серед суспільства плоди світової науки й технологій. Обговорюються основні особливості макету і дизайну періодичних видань, європейські прототипи журналів цього типу, ідентифіковано джерела текстів і декоративні типографічні елементи, встановлено важливість графіки в популяризації науки і навчання за допомогою журналів.

*Ключові слова:* дизайн преси XVIII століття, польські науково-популярні журнали XVIII століття.

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