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REVIEW ARTICLE

Dmitri Ivanovich Mendeleev (1834 – 1907), Prominent Russian Scientist. References to His Great Scientific Achievements in the Literature between 1871 and 1917

Dmitri Ivanovich Mendeleev (1834 - 1907), prominente científico ruso. Referencias a sus grandes logros científicos en la literatura entre 1871 y 1917

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ABSTRACT

In this article, the author reviews literature concerning the great Mendeleev's achievements in the seventies of the XIX century, i.e. discovery of the periodic law and fulfillment of his early predictions of unknown elements. Special attention was paid to the references concerning these achievements by chemists – authors of the English, German, and French chemical books in 1871 – 1917. This review was enriched with: 1) selected facts from Mendeleev's life and scientific activity; 2) Mendeleev's stay abroad and participation in some celebrities, and 3) a list of the authors of his biography in Russia and other countries in the world.

Keywords: D.I. Mendeleev; periodic law; Mendeleev's predictions; gallium; scandium; germanium

RESUMEN

En este artículo, el autor revisa literatura sobre los grandes logros de Mendeleev en los años setenta del siglo XIX, es decir, el descubrimiento de la ley periódica y el cumplimiento de sus predicciones tempranas de elementos desconocidos. Se prestó especial atención a las referencias sobre estos logros por los químicos - autores de los libros de química en inglés, alemán y francés en 1871 - 1917. Esta revisión se enriqueció con: 1) hechos seleccionados de la vida y la actividad científica de Mendeleiev; 2) la estancia de Mendeleev en el extranjero y la participación en algunas celebridades, y 3) una lista de los autores de su biografía en Rusia y en otros países del mundo.

Palabras clave: D.I. Mendeleev; ley periódica; predicciones de Mendeléiev; galio; escandio; germanio

Selected facts about D.I. Mendeleev's life and scientific activity

Dmitri Ivanovich Mendeleev (Figure 1) was born in Siberian town Tobolsk on February 8, 1834. He entered local middle school in 1841 and completed it in 1849. In 1856, he graduated St. Petersburg's Main Pedagogical Institute (Makarenya, 1982, p. 21). On the January 9, 1857, Mendeleev was employed in the Organic Chemistry Department at the Imperial University in Petersburg as private docent (Zagrebayevaya & Savina, 2014).

In the years 1859 – 1861, he had a fellowship to study in Heidelberg. There he worked in the Laboratory of Robert Wilhelm Bunsen (1811-1899) (Shtrube, 1981/1984, p.77).

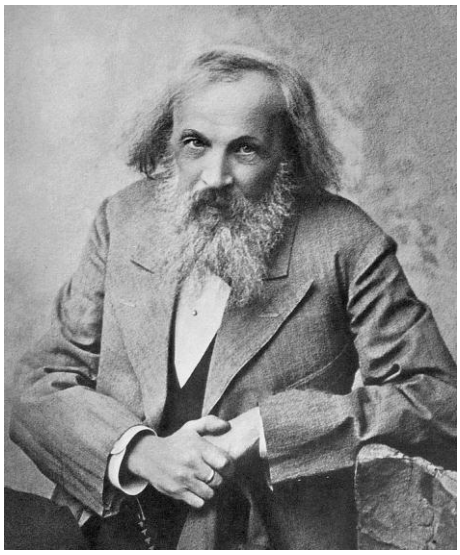

Figure 1. D. I. Mendeleev (1834-1907) ("Dmitri Ivanovitsch Mendelejew", 1890)

In 1860, Mendeleev attended the first ever international chemistry conference held in Karlsruhe (Germany) on 3-5 September (Mendeleev, 1958, pp. 660-669; Mladentsev & Tishchenko, 1938, pp. 243-260). Lecture by Cannizzaro (1826-1910) entitled "*The atomic and molecular weights*" impressed the participants in this conference, especially young ones. Cannizzaro devoted his lecture to the hypothesis formulated by Amadeo Avogardo (1776-1856), Italian physicist, in 1811. Cannizzaro clearly presented "formulas of the chemical compounds according to Avogadro and Gerhardt, and Laurent[1] ideas (Makarenya, 1982, p. 46). He also emphasized a necessity to calculate atomic weights of metals more precisely (Makarenya, 1982, p. 46). It resulted in the acceptance of his new atomistic-molecular theory by the chemists in the future. Basic assumptions of this theory Cannizzaro included in his work entitled *Sketch of a Course of Chemical Philosophy* published in 1858 (Cannizzaro, 1858).

On September 7, 1860, in Heidelberg, Mendeleev wrote a long letter to his teacher, Russian chemist Aleksandr Abramovich Voskresenskii (1809-1880), professor of chemistry at St. Petersburg's Main Pedagogical Institute. He described his impressions about his participation in the conference in Karlsruhe (Figurovskii & Solov'ev, 1950/1988, pp. 138-141). In February 1861, Mendeleev returned to Russia and gave lectures of the organic chemistry at the university in Petersburg. In 1863, he began working as a professor in the St. Petersburg Technological Institute. On 12 February, 1865, Mendeleev defended his dissertation and became Doctor of Science. In 1866, he achieved tenure at St. Petersburg University (Zagrebayevaya & Savina, 2014).

In 1876, Mendeleev with his assistant Valeri Aleksandrovich Hemilian (1851-1914) attended World Industrial Exhibition in Philadelphia. While staying in U.S.A. (from June to July 1876), Mendeleev got acquainted with oil extraction and processing in Pennsylvania State (Figurovskii, 1983, p. 149; Leicester, 1957, pp. 331-333).

[1] Achievements of the French chemists Charles Frédéric Gerhadt (1816-1856) and Auguste Laurent (1807-1853) in the development of chemistry are enormous. In 1835, Gerhardt has developed a classification of the organic compounds based on their mutual properties. He discovered organic acids anhydrides. Mendeleev used of his atomic weights system. Laurent investigated naphthalene and its derivatives. He isolated phenol from the coal tar and phthalic acid from naphthalene. Gerhardt with Laurent corrected several incorrect formulas of the organic compounds. According to Mendeleev, only "grace to Gerhardt, Laurent, and Cannizzaro, chemistry manage to get out on track to gradual use of the atomistic-molecular theory …" Highly appreciating Gerhard's merits, D.I. Mendeleev called this French scientist <<the revolutionary of chemistry>>" (Makarenya, 1982, p. 39).

In 1887, Mendeleev participated in A British Association for the Advancement of Science (BAAS) meeting in Manchester. German chemist Lothar Meyer (1830-1895)[2] also attended this meeting ("History and Heritage", 2018). In 1893, Mendeleev was appointed a director of the Central Bureau of Weights and Measures. One year later, he received honorary doctorates of two British universities – Oxford and Cambridge (Figurovskii, 1983, p. 214). In 1898, Józef Boguski[3] informed Mendeleev that married couple Curie discovered polonium and radium (Makarenya, 1982, p. 225).

In March 1900, Mendeleev met British chemist William Ramsay (1852-1916) in London. Scientists agreed that formation of the zero group in the periodic table of elements for the noble gases is necessary (Finkelsztejn, 1964). In the same year, Mendeleev visited Prague, where he met prominent Czech chemist Bohuslav F. Brauner (1855-1935), and professor of the inorganic and analytical chemistry at the Charles University in Prague (Figurovskii, 1983, pp. 230-231; Štrbàňovà & Novàk, 2014, p. 10). In April 1902, Mendeleev went to Paris, where he met Henri Becquerel (1852-1908) – discoverer of the natural radioactivity and Maria Skłodowska-Curie (1867-1934) and Pierre Curie (1859-1906) (Figurovskii, 1983, p. 232). In 1903, the seventh edition of the *Principles of Chemistry* by Mendeleev, in which the periodic table of elements, contained a separate group of the noble gases (Mendeleev, 1958, p. 364).

On September 2, 1906, Mendeleev started to write biographic notes. He concisely described the most important events in his live between 1934 and 1906. These notes were related to his parents and children, his education and career, surgery of glaucoma in the left eye (1904), and selected holidays spent abroad (Mendeleev, 1952, pp. 669-685). At the end of these notes, concerning year 1906, Mendeleev wrote:" I began to set in order my books and documents – it absorb me completely – prior to my death, although I feel quite well… Financial problems I set in order like for my death" (Mendeleev, 1952, p. 685).

Russian scientist died on the 2 February, 1907, aged 73 years. He was the author of over 400 scientific works in the field of physics, chemistry, and border science – physical chemistry. The Academy of Sciences of the USRR published 25 volumes of his scientific works in 1934 – 1957. They are his master's thesis and doctorate dissertations and publications concerning investigation of aqueous solutions, liquids and gases, works in the field of geophysics and hydrodynamics as well as works in the field of organic chemistry, gunpowder, petroleum, fuel, metallurgy, and also technology of the inorganic and organic substances (Mendeleev, 1954). Moreover, Mendeleev left several manuscripts. His name is connected not only with the periodic law. Another his discovery was chemical theory of the solutions. His publications are stored in the Museum-Archives at the A.A. Ždanov University in St. Petersburg.

The first transuranic element (Z=101) discovered by the American scientist in 1955 was named mendelevium (Md) in honor to D.I. Mendeleev (Hoffman & Lee, 1999).

Mendeleev's periodic law

At the end of 1870, Mendeleev use the term "periodic law" for the first time. In August 1871, he presented its conceptualization (Trifonov, 2006): "The properties of the elements, as well

[2] In 1864-1869, Lothar Meyer conducted works on the chemical elements classification, independently from Mendeleev. He formed a table named "System of Elements" (Seubert, 1895, pp. 6-7).

[3] Józef Boguski (1853-1933), cousin of Maria Skłodowska-Curie (1867-1934), worked under Mendeleev leadership in St. Petersburg in 1875-1876. After his return to Warsaw, he maintained friendly contact with Mendeleev.

as the forms and properties of their compounds, are in periodic dependence on, or (expressing ourselves algebraically) form a periodic function of the atomic weights of the elements (Mendeléeff, 1903/1905, pp. 17-18).

Fulfillment of Mendeleev's prognosis relating the discovery of the unknown chemical elements

In 1869, Mendeleev elaborated classification of the chemical elements for the first time. All 63 known elements Mendeleev arranged in a table according to increasing atomic weight. He also left empty places, claiming that they should be fulfilled by undiscovered elements. In 1870, Mendeleev made a few corrections in his table. His final ideas he presented in the publication entitled *Natural System of Elements and Its Use in Determination of the Undiscovered Elements"* which was published in the "Żurnal Russkogo Chimiczeskogo Obszczestwa" (Journal of the Russian Chemical Society) in 1871 (Mendeleev, 1871, cited by Mendeleev, 1958, pp. 69-101). He, first of all, defined new locations of indium, cerium, thorium, and uranium. Special attention he paid to boron and aluminium analogues – elements of the third group. According to Mendeleev, zinc should be followed by another element, named by him ekaalumini – El. Mendeleev predicted its atomic weight – 68, atomic volume – 11.5, density – 5.9, and other spectral characteristics. On August 27, 1875, French chemist Paul Emile Lecoq de Boisbaudran (1838-1912) discovered predicated by Mendeleev ekaalumini and named it gallium (Brush, 1996, p. 602; Lecoq de Boisbaudran, 1875, pp. 493-495; Mendeleef, 1875, p. 972; Mendeleev, 1958, p. 92; Smith, 1949, p. 35).

Mendeleev's prognosis concerning an existence of boron analogue, which he named ekabor – Eb, became the truth (Mendeleev, 1958, pp. 90-91). This element was discovered by Swedish chemist Lars Frederic Nilson (1840-1899) in 1879 and named scandium (Brush, 1996, p. 604; Nilson, 1879, pp. 645-648; Smith, 1949, p. 183). Discovery of germanium by German chemist Clemens Alexander Winkler on the 6th February, 1886, decisively confirmed correctness of the periodic table of the elements defined by Mendeleev (Brush, 1996, p. 605; Haustein, 2011, pp.140-144; Smith, 1949, p. 256; Winkler, 1886, pp. 210-211). Mendeleev predicted its existence. He named it ekasilici – Es, and described some of its properties (Mendeleev, 1958, p. 95; Shtrube, 1981/1984, p. 81).

References to the great Mendeleev's discoveries if the seventies of the XIX century recorded in the chemistry textbook and encyclopedia, and vocabularies in 1871-1890

Information on the periodic law

Detailed literature studies in the above period of time made Stephen G. Brush (1996) from the Department of History and Institute for Physical Science and Technology at the Maryland University (U.S.A.). Brush analyzed total 168 books in English (American and British) published in 1871-1890. He found that the authors mentioned Mendeleev's periodic law in one book published between 1871 and 1875, four books published in the years 1876 – 1880, 19 books published in 1881-1885, and 25 books from years 1886-1890. His analysis of the 76 German and French books published in the years 1871 – 1890 revealed that a short information on the periodic law appeared in 4 books published between 1871 and 1875, six books published in the years 1876 – 1880, ten books published in 1881 – 1890, and seven – in 1886-1890 (Brush, 1996, p. 602).

References to the Mendeleev's predictions fulfillment

Stephen G. Brush was searched any information of the Mendeleev's prediction fulfillment concerning the unknown chemical elements discover in the mentioned above books. It was found that such an information was two in American and British books published in 1876 –

1880. Brush found such an information also in 16 books published between 1881 and 1885, and in 20 books published in 1886 – 1890 (Brush, 1996, p. 602). Brush in his article does not inform the reader whose chemical elements concerned these references.

Analysis made by Brush revealed that the final year was 1890. Assuming that an information about discovery of three unknown elements predicted by Mendeleev, i.e. gallium, scandium, and germanium should be at least mentioned in the books published in 1890, the author of this article decided to check it. He chooses the book written by the American chemist John Howard Appleton (1840-1930), professor of chemistry in Brown University (U.S.A.) entitled *Lessons in Chemical Philosophy*. It was found that a reference concerned discover of two elements only, i.e. gallium and scandium. No information about discovery germanium in 1886 was found. Appleton wrote in his book:

> The periodic table has shown gaps in the series of numbers representing atomic weights. On the basis – as long ago as 1871 – Mendeléeff predicted the existence of two new elements, and more, he stated their general range of properties. To one he gave provisional name eka-aluminium. Now in 1876 the element gallium was discovered, and it proved to be predicted eka-aluminium. So scandium, discovered in 1879, proved to be Mendeléeff's predicted eka-boron (Appleton, 1890, p. 246).

Earlier information on the discovery of the three elements from Mendeleev's predictions were found by the author of this publication in the British book (Thorpe, 1894, p. 361), as well as in a book written by a Russian chemist Nikolai Alexandrovich Menshutkin (1842-1907) (Menshutkin, 1888, pp. 331-332).

Summing up, the results of the chemical literature review carried out by Brush indicated that the number of authors mentioning both periodic law and discovery of the new elements predicted by Mendeleev was decreasing during 20 years, i.e. between 1871 and 1890. Detailed analysis of these data revealed that the most of such an information appeared in the books by the British and American authors, the lowest number appeared in the books written by the French chemists (Brush, 1996, pp. 624 – 628). In 2015, 19 years after Brush's investigation, joint publication appeared. It was edited by Masanori Kaji, Helge Kragh, and Gàbor Palló, in which the authors bring issues of the reception of the periodic law in Russia, Germany in 1870-1910, Great Britain and France, in Czech Republic, Sweden, Denmark, and Norway, Spain and Portugal, and also Italy and Japan (Kaji, Kragh, & Palló, 2015).

Selected information about realization of the Mendeleev's three predictions from 1871 in the chemical literature in the years 1899-1917

Analysis of the available literature showed that some authors the Mendeleev's name inseparably connected with his prediction of three unknown elements and their properties (ekaalumini, ekabor, and ekasilici) in their books or articles in 1899-1917. They also mentioned successful realization of the predictions in the years 1875 – 1886 (discovery of gallium, scandium, and germanium) (Armitage, 1906, p. 253; Bauer, 1906/1907, p. 187; Clarke & Dennis, 1902, p. 171; Forbes, 1917, pp. 851-852; Griffiths, 1912, pp. 126-136; Hiortdahl, 1906, p. 127; Landenburg, 1885/1911, p. 313; Lowry, 1915, pp. 476-477; Mellor, 1914, p. 811; Mendola, 1914, p. 241; Moore, 1918, p. 188; Morgan and Lyman, 1915, p. 402; Ramsay, 1908, p. 165; Ramsay, 1911, p. 295; Senter, 1911, p. 385; Walden, 1908, p. 4750; Wiechmann, 1899, p. 75).

Mendeleev's participation in the scientific celebrations abroad

In 1875, Mendeleev attended celebrations of the 300th Anniversary of the University in Leiden (Netherlands). In August 1877, he attended celebrations of the 400th Anniversary of the University in Uppsala (Sweden). Seven years later, in April 1884, Mendeleev participated in celebrations of the 300th Anniversary of the University in Edinburgh (Scotland) (Tishchenko & Mladentsev, 1993, p. 111). He received their Honorary Doctorate (Marsden, 1884, pp. 87-88). In 1900, Mendeleev visited Berlin to participate in the conference devoted to the 200th Anniversary of Berliner (Prussian) Academy of Sciences (Figurovskii, 1983, p. 231). Figure 2 is a photography made during this celebration[4] ("200th Anniversary", 1900).

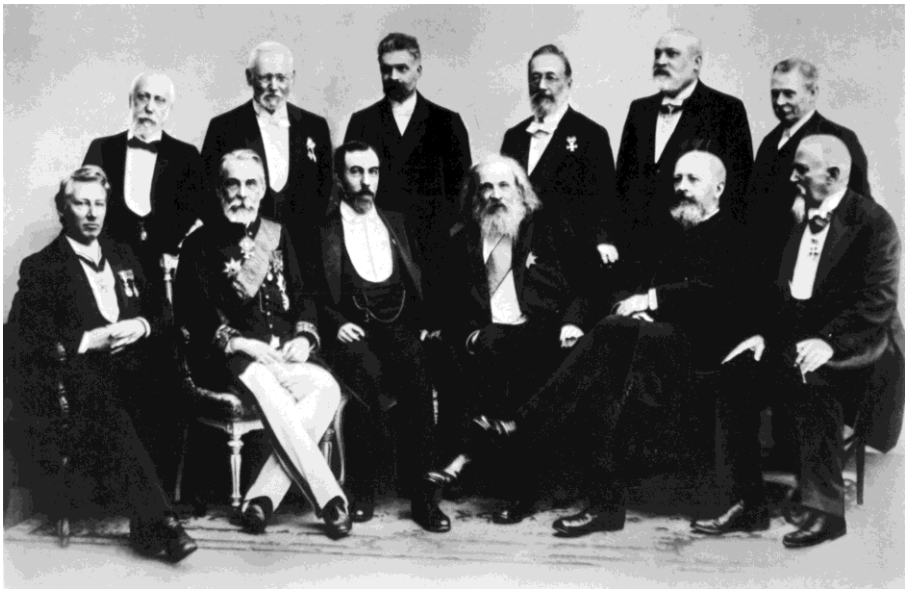

Figure 2. Mendeleev with the group of the prominent chemists ("200th Anniversary", 1900).

[4] Benjamin Harrow (1888-1970) inserted this photograph on the one of first pages of his book entitled *Eminent chemists of our time.* He wrote also that it presents "eminent chemists photographed during one of the international scientific conferences" (Harrow, 1920, p. 2). Photograph was published by Harrow thanks to the kindness of the Professor Ernst Julius Cohen (1869-1944) from the University of Utrecht in Holland. From the left to right stand: Albert Ladenburg (1842-1911), Sophus Mads Jørgensen (1837-1914), Edvard Hjelt (1855-1921), Hans Heinrich Landolt (1831-1910), Clemens Alexander Winkler (1838 – 1904), and Sir Thomas Edward Thorpe (1845 – 1925). On the left of the sitting Mendeleev was Jacobus Henricus van't Hoff (1852 – 1911), Friedrich Konrad Beilstein (1838 – 1906), and Sir William Ramsay, and on the right – Adolf von Baeyer (1835 - 1917), and Alfonso Cossa (1833 – 1902). Harrow in the further part of his book described certain incident, which happened during banquet given by the organizers in this occasion and involving Mendeleev. "In 1900 Prussian Academy celebrated its two hundredth anniversaries, and the University of Petrograd sent Mendeléeff as its delegate. At the banquet van't Hoff presided over one of the side tables, with Landerburg (the Breslau representative) to the right, and Mendeléeff to the left over him. Mendeléfff was an inveterate smoker, and simply chafed because he could not smoke alternately. Ladenburg tells us that immediately after the soup Mendeléeff began to pump those around him as to whether he could be allowed to smoke. They answered him that was out of the question. But he repeated his question after the first, and after the second courses. Then dear old van't Hoff, who hated to see anyone suffer so, stepped in with the risky suggestion that he also would join in a smoke. And the two went to it, to the great relief of Mendeléeff, who from then on proved an enjoyable companion. But the sad side of the incident was that van't Hoff, who begun to show incipient signs of tuberculosis, had been expressly forbidden smoking" (Harrow, 1920, p. 73).

Mendeleev's biographies written in Russia and other countries

Literature concerning Mendeleev's life and activity, published in the former USRR and Russia in 1938-2014, is enormous. His biographies wrote Boyarintsev (2014), Dobrotin, Karpilo, Kerova and Trifonov (1984), Figurovskii (1983), Makarenya (1982), Mladentsev and Tishchenko (1938), Pisarzhevskiy (1949), and Tishchenko and Mladentsev (1993). In 1892-2010, Mendeleev's biographies were published also in the journals and books in the languages other than Russian, mostly English. For instance, it was published in *The Popular Science Monthly* in New York under the title *Sketch of Dimitri Ivanovich Mendeleef* (Youmans, 1982, pp. 261-266). Mendeleev's biography in the German language was written by Paul Walden (1908) and Gisele Boeck and Regine Zott (2007). Mendeleev's biography in English was written by Ethel Roberts (1911, pp. 208-219), Arthur Bower Griffiths (1912, pp. 126-136), William A.Tilden (1921, pp. 241-258), George Shannon Forbes (1917), Benjamin Harrow (1910, pp. 19-40), Bohuslav Brauner (1930), Daniel Q. Posin (1948) and Gordon T. Woods (2010).

The memory of Mendeleev is always vivid, especially in Russia. In the first decade of the XXI century, two articles were published in English. Their authors describe person and achievements of this eminent chemist. The first article was published under the title *D. I. Mendeleev: Life and Creative Work* (Dimitrriev, 2009), the second – *A Great Son of Russia* (Papulov, 2009). Vera Nikolayevna Zagrebayevaya and Galina Aleksandrovna Savina, scientists from the Archives of the Russian Academy of Sciences elaborated available in the Web documental presentation in occasion of Mendeleev's 180th Anniversary of Birth. It is available in Russian (Zagrebayevaya & Savina, 2014).

CONCLUSIONS

Mendeleev, being the discoverer of the periodic law and the author of the periodic table of the chemical elements, slowly gained higher publicity in the world of chemistry, since 1871 (Solov'ev, 1984, pp. 1069-1071). In the years 1871-1903, he was elected as a foreign member of several academies of sciences and scientific associations. On the February 5, 1871 Mendeleev was elected as a foreign member of the Paris Academy of Sciences, and three weeks later – German Chemists Association. On the 1st February, 1888, Mendeleev become the foreign member of the Royal Society in Edinburgh. Czech Academy of Sciences elected him on the 2nd December, 1891, and Academy of Sciences in Rome on the November 7, 1893. At the beginning of the XX century, Mendeleev was elected the foreign member of the Italian Scientific Society (March 3, 1901) and the National Academy of Sciences in Washington (April 22, 1903). Moreover, Mendeleev had 20 diplomas of the honorary member, among other the Royal Scientific Societies in Dublin (March 4, 1886) and Goteborg (December 6, 1886), and the American Scientific Society in New York (June 12, 1889). On the 5 April, 1889, he became member of the Royal Danish Academy in Copenhagen, and on 18 February he was appointed such a member of the Cracow Academy of Sciences (Skvortsov, 1950, p. 118-120).

Since the 90th of the XIX century, England proved to be the most generous in the recognition of Mendeleev's merits. In 1882-1905, its prove were three medals and membership in the London Chemical Society and Royal Society. British chemist William Augustus Tilden (1842-1926) reported it as follows: "In 1882 the Royal Society conferred on Medeleeff, jointly with Lothar Meyer, the Davy Medal[5]. In 1883 the Chemical Society elected him an Honorary Member, and in 1889 it conferred upon him the highest distinction in its power to award, namely the Faraday Lectureship[6], with which is associated the Faraday Medal. In 1890 he was elected a Foreign Member of the Royal Society, and in 1905 he received the

Copley Medal. So far as England is concerned, his services to science received full acknowledgment. It is all the more remarkable, therefore, that he never became a member of the Imperial Academy of Sciences of St. Petersburg" (Miers et al., 1914, p. 134).

Another British chemist Thomas Edward Thorpe did homage to Mendeleev in 1889. His article about Mendeleev in the *Nature* he also inserted to the book entitled *Essays in Historical Chemistry*. His admiration he expressed in the following words:

> No man in Russia has exercised a greater or more lasting influence on the development of physical science than Mendeleeff. His mode of work and of thought is so absolutely his own, the manner of his teaching and lecturing is so entirely original, and the success of the great generalization with which his name and fame are bound up is so strikingly complete, that to the outer world of Europe and America he is to Russia what Berzelius was to Sweden, or Liebig to Germany, or Dumas to France (Thorpe, 1894, p. 364).

Mendeleev's Periodic Table of the Elements of 1869 – 1871, in its short form underwent metamorphosis because its appearance has changed. Now, chemists use its long form in the research laboratories, colleges, and universities. Moreover, this table during 147 years, which passed from 1869 to 2016, completed with the names and symbols of 55 new elements. At the beginning of 2016, the periodic table of elements four last elements were added of Z = 113, 115, 117, and 118 (Karol, Barber, Sherrill, Vardaci, and Yamazaki, 2016a, 2016b). These elements have their own names and symbols approved by the International Union of Pure and Applied Chemistry (IUPAC). These are: nihonium Nh; moscovium Mc; tennessine Ts, and oganesson Og ("Periodic Table of", 2018).

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[5] Forris Jewett Moore (1867-1927), professor of Organic Chemistry in the Massachusetts (U.S.A.) wrote in his *History of Chemistry*: "There was for a time a good deal of feeling between friends of Lothar Meyer and those of Mendelejeff upon the question of priority in the discovery of the periodic law (…) The fundamental idea, that the properties of the elements are a periodic function of their atomic weights, had been a slow growth, to which these two men independently gave permanent form of expression. In 1882 the Royal Society conferred the Davy medal upon both in recognition of this fact, and we can well follow the spirit of their compromise. There is documentary evidence that Lothar Meyer had put in writing an arrangement of the elements as early as 1868. His first printed communication on the subject, however, was published in 1870, and contains a reference to the first paper by Mendelejeff" (Moore, 1918, pp. 184-185).

[6] At the end of May and first days of June 1888, Mendeleev with his second wife Anna Ivanovna (1860-1942) stayed in London. On June 4, he had to give his Faraday Lecture. One day earlier, he received telegraphic message about the illness of his younger son. Therefore, a couple decided to return to Russia as soon as possible. However, announced lecture took place. It was given by Professor Henry Edward Armstrong (1848-1937), secretary of the Chemical Society, and president of this Society – William James Russell (1830-1909) explained the audience reasons of Mendeleev's absence. After the lecture, Sir William Anderson (1835-1898) was given Faraday Medal to hand it over to Mendeleev. Earlier, Anderson was also go-between Mendeleev and the Royal Society in the choice of the Faraday Lecture subject (Tishchenko & Mladentsev, 1993, p. 116).

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