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REVISION BIBLIOGRAFICA

Ira Remsen (1846-1927) – the Eminent American Chemist of the Second Half of the XIX Century and the First Quarter of the XX century (To the 95th Anniversary of His Death)

Ira Remsen (1846-1927) - el químico estadounidense eminente de la segunda mitad del siglo XIX y el primer cuarto del siglo XX (Al 95 aniversario de su muerte)

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ABSTRACT

Ira Remsen (1846-1927) was one of the great American chemists. He carried out his experimental studies in the field of organic chemistry. In 1879, he became a co-discoverer of saccharin. He was the first professor of chemistry (1876-1901) and the second president (1901-1913) of the Johns Hopkins University in Baltimore. The purpose of this paper is to familiarize readers with the important events in the life of Remsen and his writing activities, in particular with his chemistry textbooks, well-known in various countries. In addition, literature on his selected articles is presented.

Keywords: I. Remsen, Organic Chemistry, Saccharin, Johns Hopkins University, United States – XIX-XX centuries.

RESUMEN

Ira Remsen (1846-1927) fue uno de los grandes químicos estadounidenses. Realizó sus estudios experimentales en el campo de la química orgánica. En 1879, se convirtió en un co-descubridor de la sacarina. Fue el primer profesor de química (1876-1901) y el segundo presidente (1901-1913) de la Universidad Johns Hopkins en Baltimore. El propósito de este artículo es familiarizar a los lectores con los acontecimientos importantes en la vida de Remsen y sus actividades de escritura, en particular con sus libros de texto de química, bien conocidos en varios países. Además, se presenta literatura sobre sus artículos seleccionados.

Palabras claves: I. Remsen, Química Orgánica, Sacarina, Universidad Johns Hopkins, Estados Unidos - siglos XIX-XX.

INTRODUCTION

The important events in Remsen's life

Ira Remsen (1846-1927) (Figure 1) was called “the outstanding figure in American chemistry” (Noyes & Norris, 1931, p. 207), “a very active hard working chemist doing good work in the way of research” (Hawkins, 1960, p. 47), and “one of the great teachers of chemistry” (Considine, 2005, p. 1). Ninety-five years have passed since his death, but during this time few articles about this eminent American scientist were published. The American chemist Henry Monmouth Smith (1868-1950) wrote briefly about Remsen's career, research field and achievements in his book, published in 1949:

Studied with Liebig and Fittig. Professor of Chemistry (and later President) of Johns Hopkins University. His work was in organic chemistry; discovered saccharine. Wrote eight textbooks which were most successful; founded the American Chemical Journal, later absorbed by the Journal of the American Chemical Society. His name will be longest remembered as a great teacher who founded graduate research in chemistry in the United States (p. 214).

Ira Remsen (1846-1927) was born in New York City on February 10, 1846, and he was the son of James Vanderbilt Remsen (1818-1892) and his wife Rosanna, née Secor (1823-1856) (Getman, 1939, p. 353; Getman, 1940, pp. 3-4; “Ira Remsen, chemist”, 2021).

Fig. 1. *I. Remsen (1846-1927) (“Ira Remsen. 19th”, n.d.).*

At the age of 14, he became a student in the New York Free Academy, later renamed the College of the City of New York. There, he attended lectures on chemistry by Professor Wolcott Gibbs (1822-1908) (Getman, 1939, p. 354; Getman, 1940, p. 7).

After graduating from the New York Free Academy, he continued his studies in the

College of Physicians and Surgeons at Columbia University. In 1867, at the age of 21, he graduated with honors from this College with the degree of M.D. for his thesis *Fatty Degeneration of the Liver* (Haake, 1999).

He worked briefly, about a year, as a practicing physician on Irving Place in New York City (Getman, 1940, p. 17) "and then decided to pursue the subject that interested him: chemistry" (Newton, 2007, p. 64). In the same year, he began his chemical studies in Germany, first at the University of Munich and then at the University of Göttingen. The American chemist Frederick Hutton Getman (1877-1941) wrote about this period in his life (Getman, 1940) as follows:

Upon his arrival in Munich in the late summer, after a long and somewhat tiresome journey from America, Remsen received the disappointing information that [Justus von] Liebig [(1803-1873)] was no longer receiving students in his laboratory and that, except for a single course of lectures, he would have no opportunity to receive instruction from the great master whose fame as a chemist had lured him across the seas. Nothwithstanding this well-nigh crushing disappointment, he was fixed in his determination to become a chemist and accordingly registered at the university for the winter semester, entering his name, not only for Liebig's lectures on general chemistry, but also for two courses by [Jacob] Volhard [(1834-1910)]. His course book indicates that he also attended a course of lectures on astronomy (p. 23).

After his first year at Munich, where he worked under Volhard in Analytical Chemistry, he went to Göttingen to study of organic chemistry under Rudolph Fittig (1835-1910).

In 1870, he defended his doctoral dissertation entitled *Investigations on Piperic Acid and Derivatives* and received his Ph.D. Figure 2 shows the title page of his dissertation (Remsen, 1870).

In the years 1870-1872, he worked as a laboratory assistant to Fittig and a lecturer at the University of Tübingen. Fittig succeeded Adolf Strecker (1822-1871) and was appointed Professor of Chemistry at that University.

During his stay in Tübingen, he met William Ramsay (1852-1916) who came to Tübingen from England to continue his chemical studies and who became his lifelong friend, and "with whom he kept up a friendly correspondence to the end of his life" (Tilden, 1918, p. 33).

In a letter, dated on May 8, 1871, Ramsay wrote (Tilden, 1918):

I go regularly to Fittig's lecture at 8. He lectures very distinctly and clearly. It is really very beautiful to see the way the organic compounds are arranged. . .. Dr. Remsen, the assistant in the laboratory here, is very obliging and pleasant. He is an American. If I am here in winter, I must board with some family, for it is very difficult to pick up any German, living in lodgings (pp. 31-32).

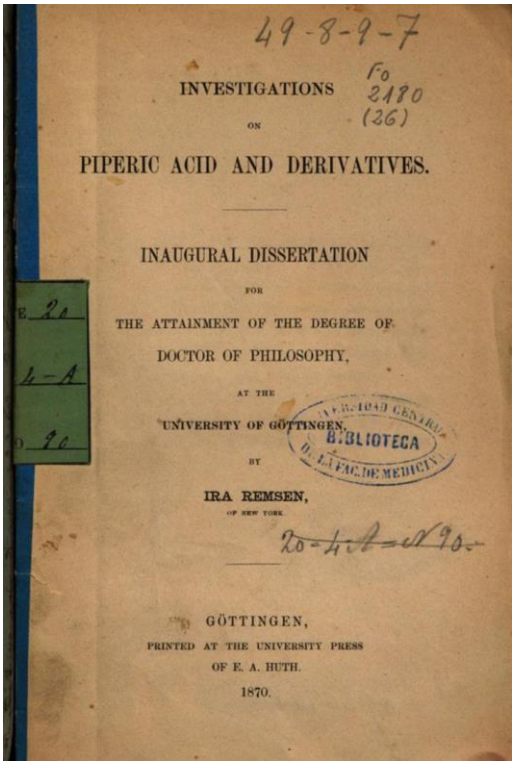


Fig. 2. *Title page of I. Remsen's Investigations on Piperic Acid and Derivatives. Inaugural Dissertation for Attainment of the Degree of Doctor of Philosophy, at the University of Göttingen(Göttingen: Printed at the University Press of E. A. Huth, 1870).*

Remsen mentions his first meeting with Ramsay in a letter sent to Lady Margaret Ramsay (1855-1936), his wife, after the death of Sir William Ramsay in 1916 (Getman, 1940):

After all it must be remembered that your husband was a boy at that time—only 18 when came to Tübingen—and I was not far removed from boyhood, so that the things I recall of those days are the things that interest boys for the most part. We were at the beginning of our lives with hopes, with aspirations, with some anxiety for the future, with doubts, and yet I do not remember that we ever discussed such matters. I am thankful for the fact that the lives of our group of English-speaking students were wholesome. They were not goody-goody as a rule, but they were not in any sense bad. They were healthy boys with lots to learn and a strong desire to learn. “In looking over recently some letters from my old firend, Ramsay, I came upon one dated March 23, 1904, that began with these words: 'Who would have thought when you opened the big, front door of the Tübingen laboratory in 1871 and in answer to my question in questionable German—“Können Sie sagen wo ist die Vorlesungszimmer?” you replied after a pause—“Oh, I guess you want the lecture room,“—that I should now write after 33 years to tell you—.' This was one of his favorite stories. I have heard him tell it in public and I have read it in print. That is the way we first met, now 46 years ago. That was the beginning of a lifelong friendship. We met perhaps a half-dozen times in all these years, but we kept up a fairly active correspondence until the last. I am now asked to give a little account of the Tübingen days. “In 1870, Fittig, with whom I had worked at Göttingen, was called to Tübingen to succeed Strecker. He invited me to go with him and to serve as one of his assistants. I accepted, and so it came about that I was holding a minor place in the chemical laboratory when Ramsay arrived. It has

always been a source of satisfaction to me that it was I who opened the 'big front door' for him. This fact gives me a feeling that I have been of some service to Chemistry. I remained in Tübingen until the spring of 1872, so that our association was only for one year. He came up for examination for the doctor's degree a year later, but of this second year I know little, and that is only hearsay (pp. 32-33).

After returning from Germany to the United States in the spring of 1872, he was appointed professor of physics and chemistry at Williams College in Williamstown (Massachusetts) (Miall & Miall, 1949, p. 444).

In 1875, he married Elisabeth Hilliard, née Mallory (1851-1934). The spouses had two sons, Ira Mallory Remsen (1876-1928) and Charles Mallory Remsen (1879-1969) ("Ira Remsen, chemist", 2021; Noyes & Norris, 1931, p. 229).

In 1876, he became the first professor of chemistry at the newly established Johns Hopkins University in Baltimore (Hannaway, 1976). Three years later, he founded and edited the first volume of the *American Chemical Journal* (Remsen, 1879). Thirty-four years later, in 1913, the 50th volume of this journal was published (Remsen & Rouiller, 1913).

In 1901, he became the second president (1901-1913) of the Johns Hopkins University. His inauguration took place on February 21, 1902 (Anonymous, 1902). He succeeded Daniel Coit Gilman (1831-1908), who resigned after serving twenty-five years as the first president of this university (Getman, 1939, p. 358).

On April 9, 1912, he submitted to the Trustees of the University a letter resigning his office as President. Here is an excerpt from it (Anonymous, 1912):

For some time past it has seemed to me best that I should retire from the presidency of the University. Those whom I have consulted, however, have urged me to continue until certain important things should be accomplished. As these have now been accomplished, I see no reason for further delay, and accordingly hereby tender my resignation, to take effect at the end of the present academic year. … I have held the office for eleven years. This covers a fairly well defined period in the history of the University, a period of steady growth, and especially one of preparation for the new era. … For myself, my interest and devotion to scientific work strongly incline me to return to that life, a life which I abandoned with great regret and which I have always looked forward to taking up again (pp. 3-4).

Ira Remsen died on March 4, 1927. His obituary written by Henry E. Armstrong was published in 1927 in *Nature* (Armstrong, 1927). In the same year, his obituary by William A. Noyes appeared in the *Journal of the Chemical Society* (Noyes, 1927a). Frederick H. Getman (1940) briefly described the last days of Remsen's life and his funeral as follow:

Late in February after finishing his dinner, he complained of a slight headache and shortly afterward went to bed. The next morning on entering the bathroom he fell to the floor having suffered a severe cerebral hemorrhage. After a week of pathetic helpessness which he endured with patirnt submission, his valiant spirit was released on the fourth day of March, nineteen hundred an twenty-seven, just three weeks after he had passed his eighty-first birthday. … The body od Dr. Remsen was taken to San Francisco for cremation and his ashes were brought to Baltimore for interment. A funeral service was held in Christ Church, the office for the burial of the dead being read by Rev. Edwin B Niver, a former rector of the church, an a personal friend of Dr. Remsen. The urn containing the mortal remains of Ira Remsen was later sealed in the wall of one of the main stairways of the chemical laboratory and suitably marked with a bronze memorial tablet (pp. 152-153).

The following inscription appears on Remsen's Memorial Tablet in Remsen Hall at

Johns Hopkins University: /BEHIND THIS TABLET/ REPOSE THE ASHES OF/ IRA REMSEN/1846 – 1927/ PROFESSOR OF CHEMISTRY / 1876-1901/ PRESIDENT/ 1901-1913/ (Getman, 1939, p. 360; Getman, 1940, p. 152; Hartford, 1946, p. 262).

Remsen's works

The list of Remsen's published works includes ninety-eight papers. There are the articles published in Germany in the journals *Zeitschrift für Chemie, Justus Liebigs Annalen der Chemie* and *Berichte der deutschen chemischen Gesellschaft*, and many papers published in the *American Chemical Journal* (Anonymous, 1916; Getman. 1940, pp. 161-171; Noyes & Norris, 1931, pp. 230-237).

Remsen's first works in the field of organic chemistry were published in 1869-1870 in the *Zeitschrift für Chemie* and *Justus Liebigs Annalen der Chemie*. The first one concerned naphthalene homologues (Fittig & Remsen, 1869), for instance, methylnaphthalene ($C_{11}H_{10}$ = $C_{10}H_7.CH_3$) and ethylnaphthalene ($C_{12}H_{12}$ = $C_{10}H_7.C_2H_5$) (Fittig & Remsen, 1870, pp. 114-115, 118-119). Another article, written together with Fitting, dealt with further research on piperic acid, a compound related to his doctoral dissertation (Remsen & Fittig, 1870a). The article presenting the results of an experimental study carried out at the Chemical Laboratory of the University of Tübingen concerned the conversion of piperonylic acid ($C_8H_6O_4$) into protocatechuic acid ($C_7H_6O_4$) (Remsen & Fittig, 1870b, p. 428).

In 1871, he published several articles in the *Zeitschrift für Chemie*. He shared with the readers of this journal the results of his experimental research on a new mode of formation of paraoxybenzoic acid (Remsen, 1871a). His published papers concerned parasulfobenzoic acid (Remsen, 1871b), the synthesis of piperonylic acid (Fittig & Remsen, 1871), the effect of melting potassium hydrate on sulfoxybenzoic acid (Remsen, 1871c), isomeric sulfosalicylic acids (Remsen, 1871d) and oxidation of toluenesulfonic acids (Remsen, 1871d).

In subsequent years, after leaving Tübingen, he published the results of his experimental studies in the *Berichte der deutschen chemischen Gesellschaft* and *American Chemical Journal.*

In 1901, his works concerned the action of aromatic sulphonchlorides on urea, $CO(NH_2)_2$ (Remsen & Garner, 1901) and on thiourea (CSN_2H_4) (Remsen & Turner, 1901) Two years later, his last chemical article entitled *Further investigations on the Two Isomeric Chlorides of Orthosulphobenzoic Acid* was published (Remsen, 1903a).

In 1913, he published abstract in English (R[emsen], 1913) of an article by Carl Graebe (1841-1927) entitled *Der Entwicklungsgang der Avogadroschen Theorie* (Graebe, 1913). Ten years later, he presented to the Academy at the annual meeting the biographical Memoir of the American chemist Harmon Northrop Morse 1848-1920), later published in the *Memoirs National Academy of Sciences* (Remsen, 1923).

Ira Remsen and the Discovery of Saccharin

In 1879, Ira Remsen and the German chemist Constantin Fahlberg (1850-1910) discovered benzoic sulphinide ($C_7H_5NO_3S$) designated as "saccharin" (Fahlberg & Remsen, 1879; Remsen & Fahlberg, 1879-1880). Five years later, on December 1, 1885, Fahlberg appropriated the discovery and obtained a patent for manufacture of saccharin ("United States Patent", 1885), and organized the mass production of this compound in Germany (List, 1893).

The term "Falberg's saccharin" began to be used in many publications of the time, and Remsen's surname was omitted (Kauffman & Priebe, 1978; Warner, 2008). Below the

bibliographic details of Stutzer's book (Stutzer, 1890), the American chemist and bibliographer Henry Carrington Bolton (1843-1903) wrote: “Saccharin was discovered by Ira Remsen and his assistant, Constantine Fahlberg; there are no reasons why it should bear Fahlberg's name, and good reasons for its bearing Remsen's name” (Bolton, 1893, p. 859).

After Fahlberg received a patent for the production of saccharin, Remsen, as its co-discoverer, tried to clear up occurred misunderstanding. In a footnote to an article published in 1886 (Remsen & Palmer, 1886), he wrote about saccharin as follow:

[1]This substance has recently come into some prominence under the name “saccharin,” which is given to it on account of its sweet taste. In the notices of saccharin, even in scientific journals, the statement is constantly made that the substance was discovered by Fahlberg. The statement needs modification. As a matter of fact, the substance came to light in the course of an investigation which Fahlberg undertook at my suggestion, and carried on under my direction, and it was first described in a paper by myself and Fahlberg which appeared in the Berichte der deutschen chemischen Gesellschaft, Band 12, S. 469 [Fahlberg & Remsen, 1879]. A more detailed account of the investigation was published later in this Journal, Vol. I., p. 426 [Remsen & Fahlberg, 1879-1880]. —I. R. (p. 223).

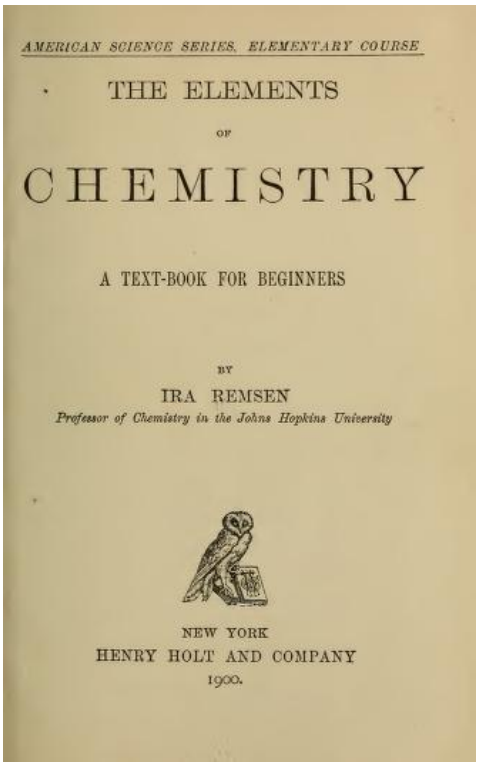
Remsen's books on chemistry

In 1877, his *Principles of Theoretical Chemistry, with Special Reference to the Constitution of Chemical Compounds* was published in Philadelphia (Remsen, 1877a). The third American edition of this book appeared in 1887 (Remsen, 1887a), and the fifth in 1897 (Remsen, 1897). The Russian edition of this book under the title *Printsipy Teoreticheskoy Khimii* was published in 1887 in Kharkov. The translator was the Russian chemist Ivan Pavlovich Osipov (1855-1918) (Remsen, 1887b; Bolton, 1899, p. 350). In 1888, the German edition entitled *Grundzüge der theoretischen Chemie. Mit besonderer Rucksicht auf die Constitution chemischer Verbindungen* appeared in Tübingen (Remsen, 1888; Bolton, 1893, p. 769). The fourth English edition of this book was published in 1892 (Remsen, 1892a). In the same year, the Italian edition under the title *Principi Di Chimica Teorica, Con Speciale Considerazione Alla Costituzione Dei Composti Chimici* appeared in Pisa. The translator was Alessio Alessi (Remsen, 1892b; Bolton, 1893, pp. 769-770).

In 1886, his book entitled *An Introduction to the Study of Chemistry* appeared in New York (Remsen, 1886; Anonymous, 1886). The sixth American edition of this book was published in 1902 (Remsen, 1902a), and the eighth in 1909 (Remsen, 1909a). In 1893, the Russian edition under the title *Vvedeniye k izucheniyu khimii* appeared in Kiev. The translator was N. N. Volodkevich (Remsen, 1893a; Bolton, 1899, p. 349). In the same year, the Japanese edition of this book was published in Tokyo. The translator was Hirano Ikkwan (Remsen, 1893b; Bolton, 1899, p. 349). The first German edition under the title *Einleitung In Das Studium der Chemie* appeared in 1887 in Tübingen (Remsen, 1887c). Eight years later, the second German edition of this book was also published in that city (Remsen, 1895a). From 1904 (third edition), the book was published many times in Germany. Its last edition (twenty-first) appeared in 1963 (“WorldCat. 'Einleitung in”, 2021). The French edition under the title *Introduction à lé'tude de la Chimie* was published in 1895 in Namur. The translator was H. de Greef (Remsen, 1895b; Bolton, 1899, p. 349). The sixth English edition of this book was published in 1902 in London (Remsen, 1902b).

His book under the title *The Elements of Chemistry. A Text-Book for Beginners* was published by Macmillan and Company in New York and London in 1887 (Remsen, 1887d; Anonymous, 1887). Two years later, the Japanese edition of this book appeared in Tokyo. The translator was Yoshioka Titsutaro (Remsen, 1889; Bolton, 1889, p. 349). In 1893, the

Japanese edition was reissued. The translators were Kuhara Mitsuru and Ota Kenjiro (Remsen, 1893c; Bolton, 1899, p. 349). In 1900, this book (Figure 3) was published by Henry Holt and Company in New York (Remsen, 1900).


AMERICAN SCIENCE SERIES, ELEMENTARY COURSE

THE ELEMENTS

OF

CHEMISTRY

A TEXT-BOOK FOR BEGINNERS

BY

IRA REMSEN

Professor of Chemistry in the Johns Hopkins University

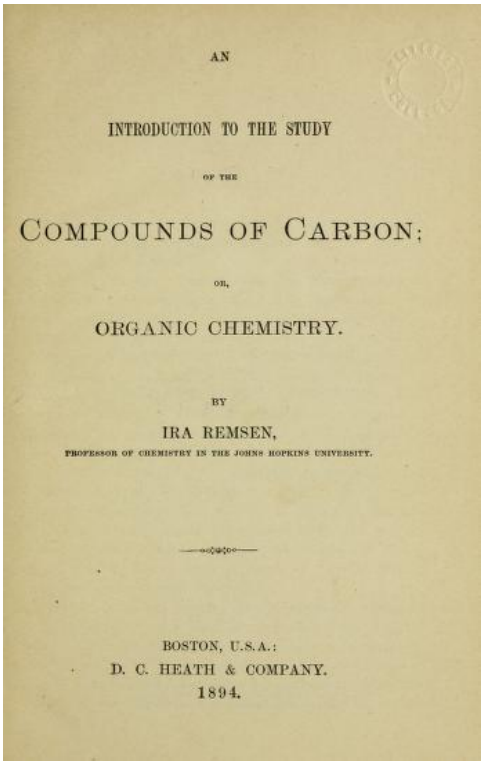
NEW YORK

HENRY HOLT AND COMPANY

1900.

Fig 3. *Title page of Ira Remsen's The Elements of Chemistry. A Text-Book for Beginners (New York: Henry Holt and Company, 1900).*

In 1885, he wrote a book entitled *Introduction To The Study Of The Compounds Of Carbon; Or, Organic Chemistry,* that was published in Boston (Remsen, 1885; Anonymous, 1885). Nine years later, this book (Figure 4) also appeared in Boston (Remsen, 1894a). The fourth American edition of this book was published in 1903 (Remsen, 1903b), and the fifth revision in 1909 (Remsen, 1909b). In 1886, the German edition under the title *Einleitung in das Studium der Kohlenstoffverbindungen, Oder organische Chemie* appeared in Tübingen (Remsen, 1886). A second German edition of Remsen's *Einleitung* was published in 1891, and the third in 1897. In 1887, the Russian edition under the title *Vvedenie k izucheniyu organicheskoy khimii ili khimii uglerodistykh soyedineniy* appeared in St. Petersburg. The translator was N. S. Drentel'n (Remsen, 1887e; Bolton 1899, p. 350). The Italian edition entitled *Chimica Organica, Introduzione Alio Studio Dei Composti Carboniosi* was published in 1888 in Naples (Remsen, 1888; Bolton, 1899, p. 350). In 1894, the English edition of this book appeared in London (Remsen, 1894b). A year later, the French edition entitled *Introduction à l'étude des composés du carbone, ou Chimie Organique* was published in Paris. The translator was H. de Greef (Remsen, 1895c; Bolton, 1899, p. 349).



AN

INTRODUCTION TO THE STUDY

OF THE

COMPOUNDS OF CARBON;

OR,

ORGANIC CHEMISTRY.

BY

IRA REMSEN,

PROFESSOR OF CHEMISTRY IN THE JOHNS HOPKINS UNIVERSITY.

BOSTON, U.S.A.:
D. C. HEATH & COMPANY.
1894.

Fig 4. *Title page of Ira Remsen's An Introduction to the Study of the Compounds of Carbon; or, Organic Chemistry (Boston, U.S.A.: D. C. Heath & Company, 1894).*

In 1889, he wrote a book entitled *Inorganic Chemistry*. The second American edition of this book appeared in 1890 in New York (Remsen, 1890a). In the same year, the German edition entitled
Anorganische Chemie was published in Tübingen (Remsen, 1890b). The Russian edition under the title *Neorganicheskaya khimiya* appeared in 1914 in Moscow. The translator was the Russian chemist Nikolay Aleksaandrovich Shílov (1872-1930) (Remsen, 1914).

The second edition of his *A Laboratory Manual Containing Directions for a Course of Experiments in General Chemistry* was published in New York by Henry Holt and Company (Remsen, 1890c).

In 1895, together with Wyatt William Randall (1867-1930), he wrote a book entitled *Chemical Experiments, Prepared to Accompany Remsen's "Introduction to the Study of Chemistry"*. The second edition of this book appeared in 1902, and the third was published in 1906. It was revised by Joseph Elliot Gilpin (1866-1924) (Remsen, 1906).

In 1905, his book entitled *A College Text-Book of Chemistry* was published in New York by Henry Holt and Company (Remsen, 1905). The second American edition of this book appeared in 1908 (Remsen, 1908). Two years later, the second English edition of this book was published in London (Remsen, 1910).

CONCLUSION

Ira Remsen (1846-1927) was the eminent American chemist of the second half of the 19th century and first quarter of the 20th century. He received many scientific honours. Among them, there are membership of the Academy of Sciences and Scientific Societies as well as medals.

In 1882, he became a member of the National Academy of Sciences (True, 1913, p. 339). From April 23, 1903, to April 18, 1907, he was vice-president of the Academy. On April 18, 1907, he was elected president and retired in 1913 (True, 1913, p. 335). He succeeded Alexander Agassiz (1835-1910), who headed the Academy in 1901-1907 (True, 1913, p. 84).

He became president of the American Chemical Society (1902), the American Association for the Advancement of Science in 1903 (Marcus, 1903), and the Society of Chemical Industry (1910) (Noyes & Norris, 1931, p. 228; Getman, 1940, p. 157).

He was an honorary member of the Société Chimique de France, the Pharmaceutical Society of Great Britain and the American Chemical Society. He was elected a foreign honorary Fellows of the Chemical Society of London (Noyes & Norris, 1931, p. 228).

He received many honorary degrees, among them from University of Columbia (1893), Pricenton University (1896), Yale University (1901), University of Toronto (1902), Harvard University (1909), Pennsylvania College (1910), and University of Pittsburgh (1915) (Noyes & Norris, 1931, p. 228).

On May 1914, he received the Willard Gibbs Medal Award (“ Willard Gibbs Medal”, n.d., p. 163). In 1923, he was awarded the first Priestley Medal (Anonymous, 2008). It is awarded by the American Chemical Society for “distinguished services to chemistry” (“ACS. Priestley Medal”, n.d.).

In 1873, he translated the eight German edition of Rudolph Fittig's book entitled *Wöhler's Grundriss der organische Chemie* (Fittig, 1872). This book was published in the United States under the title *Wöhler's Outlines of Organic Chemistry* (Fittig, 1873).

Some authors wrote about his life and works. For instance, in 1920, the American biochemists Benjamin Harrow (1888-1970) wrote about him in his book entitled *Eminent Chemists of Our Time* (Harrow, 1920, pp. 197-215). His biographical sketch by William Albert Noyes appeared in 1927 in *Science* (Noyes, 1927b). His *Biographical Memoir* by William A. Noyes and James Flack Norris was published in 1931 by National Academy of Sciences (Noyes & Norris, 1931).

In 1939, an article about him by Frederick H. Getman was published in the *Journal of Chemical Education* (Getman, 1939). One year later, Remsen's biographical book by the same author appeared in Easton (Getman, 1940). His biographical note was published in a book edited by Stephen Miall and L. Mackenzie Miall in 1949 (Miall & Miall, 1949). In 1980, an article by Roger R. Festa about him appeared in the *Journal of Chemical Education* (Festa, 1980).

Charles Seibold Herrera defended his doctoral thesis entitled *Ira Remsen and the Scientific Transformation of American Graduate Education* in 1993 (Herrera, 1993). In, 2018, an article about him by Bill Palmer appeared in the *Chemistry in Australia* (Palmer, 2018).

After Remsen, not only his papers and books survived. In addition, several of his portraits were produced. One of the portraits shows him as the new president of the Johns Hopkins University (“Dr. Ira N. Remsen”, n.d.). One of his photograph was included in the *History Of The First Half Century Of The National Academy Of Sciences 1863-1913* by Frederick W. True (1913, p. 256). Another of his portraits can be found in the book by Frederick H. Getman (1940, pp. 1, 10, 30, 44). His other portrait photograph is available in the Queens College Special Collections and Archives (Queens, New York) (“Portrait of Ira”, n.d.).

The World Biographical Encyclopedia (“Ira Remsen, chemist”, 2021) wrote about him as follows:

Ira Remsen was an American chemist and educator. His fame rests on his brilliance as a teacher, lecturer, text writer, builder of a Johns Hopkins University (where he also serves as a president), and inspirer of students. His research involved mainly aromatic chemistry, but he was especially highly regarded when he, along with Constantin Fahlberg, accidentally discovered saccharin (p. 1.).

Ira Remsen, as an outstanding American chemist, went down in the history of chemistry, and his name was written in it forewer. It became possible thanks to his scientific achievements and services rendered for 37 years, from 1876 to 1913, as well as his books, some of which were translated into German, Russian, French, Italian and Japanese.

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