

Ernst Julius Cohen (1869-1944) – the Distinguished Dutch Chemist and Historian of Chemistry of the Second Half of the XIX Century and the First Half of the XX Century

Ernst Julius Cohen (1869-1944) - el distinguido químico e historiador holandés de la química de la segunda mitad del siglo XIX y la primera mitad del siglo XX

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ABSTRACT

Ernst Julius Cohen (1869-1944) was an outstanding Dutch chemist and historian of chemistry of the second half of the XIX century and the first half of the XX century. He contributed to the fields of polymorphism, thermochemistry, electrochemistry and piezochemistry. He also studied physical isomerism. His experimental studies on allotropy has been published in a large number of publication. The purpose of this paper is to familiarize readers with the important events in the life of Cohen and his research activities, in particular with his selected publications as well as with his writing activities, in particular with his books.

Keywords: E. J. Cohen, Physical chemistry, History of chemistry, Allotropy, The Netherlands, – XIX – XX centuries.

RESUMEN

Ernst Julius Cohen (1869-1944) fue un destacado químico e historiador de la química holandés de la segunda mitad del siglo XIX y la primera mitad del siglo XX. Contribuyó a los campos del polimorfismo, termoquímica, electroquímica y piezoquímica. También estudió isomería física. Sus estudios experimentales sobre alotropía se han publicado en un gran número de publicaciones. El propósito de este artículo es familiarizar a los lectores con los acontecimientos importantes en la vida de Cohen y sus actividades de investigación, en particular con sus publicaciones seleccionadas, así como con sus actividades de escritura, en particular con sus libros.

Palabras claves: E. J. Cohen, Química física, Historia de la química, Alotropía, Países Bajos - siglos XIX – XX.

INTRODUCTION

The important events in the Cohen life

Ernst Julius Cohen (1869-1944) was called “the distinguished Dutch men of science” (Donnan, 1947, p. 1700). Seventy-eight years have passed since his death, but in that time very little has appeared in the literature about this very interesting man. It should be remembered that he went down in the history of chemistry as a person who conducted experimental studies in the fields of polymorphism, allotropy, thermochemistry, electrochemistry and piezochemistry. In addition, he was the author of many books on chemistry and the history of chemistry.

The Dutch chemist Hugo Rudolph Kruyt (1882-1959) in his article published in 1950 in *Jaarboek der Koninklijke Nederlandse Akademie van Wetenschappen 1949-1950* wrote about him: Ernst Collen was primarily an experimenter. ... He felt happiest in the laboratory. The theory didn't particularly appeal to him, he regarded teaching as an inevitable evil. He was a master of the experimental field ... and was extremely astute in the devising methods. He had a love for the precise; ... He was an exemplary analyst with a strong preference for gravimetric methods. ... He liked to build complex equipment, in which every detail was accounted for. Electric methods were his preference, but only sharp reproducible (reversible) processes found favor in his eyes, because he hated inaccurate results. The young chemist had to be trained in the laboratory, so and he excellent experimenters came out of his students (p. 266-267).

Ernst Julius Cohen (Figure 1), known simply as Ernst Cohen was born into a Jewish family in Amsterdam (The Netherlands) on March, 7, 1869, and he was the son of the German chemist Jacques Cohen (1833-1881), Director of the “Company for Chemical Industry” (the Netherlands Coal Tar Distillery), and his wife Johanna (née Rosenthal) (1835-1915) (Jorissen, 1918, p. 443; Donnan, 1947, p. 1701). Ernst Cohen's mother was a native of Hanover (Germany) and after her marriage to his father in 1863, the spouses became Dutch by naturalization (Donnan, 1947, p. 1701).

In 1886, he graduated from the five-years *Hogereburgerschool* in Amsterdam and decided to study chemistry at the University of Amsterdam. On June 1888, he passed the required State examination, after which he entered the University. Two years later, in 1890, he passed the *kandidaatsexamen* (Candidate Exam). In the same year, he went to Paris and worked in the laboratory of the French chemist Henri Moissan (1852-1907), who isolated fluorine in 1886 and later was awarded the Nobel Prize in Chemistry in 1906. After returning to Amsterdam, he began to prepare for his *doctoraalexamen* (Doctoral Exam), and in November 1892 he successfully passed it (Snelders, 1997, p. 58; Donnan, 1947, p. 1701).

On November 8, 1893, he defended his doctoral dissertation entitled *Het bepalen van Overgangspunten langs Electricischen Weg en de Electromotorische Kracht bij Scheikundige Omzetting* (The Electrical Method of Determining Transition-Points and the Electromotive Force of Chemical Reactions) and attained his doctorat in chemistry with honours. The supervisor of his dissertation was the Dutch chemist Jacobus Henricus van't Hoff (1852-1911) (Snelders, 1997, p. 58; Donnan, 1947, p. 1700).

On December 21, 1893, he married Louise, neé Gompetrz. The spouses had two childrens: one son and one daughter. After the death of his first wife on August 31, 1920, he married Sophia Catharina Johanna, neé Voute, on April 3, 1922. There were no children from this marriage. After his divorce on July 4, 1929, he married Wilhelma Abramina Titia de Meester (1899-1989) on December 12, 1929. There were no children from this marriage either (“Cohen, Ernest Julius”, n.d.).

On October 24, 1901, he was appointed extraordinary Professor of Chemistry in

the University of Amsterdam, and on June 23, 1902 he became full Professor of Inorganic and General Chemistry and director of the Van 't Hoff laboratory at the University of Utrecht. He worked there until his retirement on May 26, 1939 (Snelders, 1997, p. 69). In 1920, he went to London as one of the foreign lecturers invited by the University of London (Donnan, 1927, pp. 530-531).

He did not survive the Second World War. "He was foully murdered on or about March 5th, 1944, in a gas chamber at the "extermination" camp of Auschwitz" (Donnan, 1947, p. 1701; Donnan, 1948, p. 668).

The tragic end of Ernst Cohen's life has been described in Dutch by Hugo Rudolf Kruyt (1882-1959) in the *Chemisch Weekblad* (Kruyt, 1945, pp. 126-127). The Irish physical chemist Frederick George Donnan (1870-1956) in Cohen's obituary (1948) wrote about it as follows:

In 1941 his property was seized and in April 1942 his house was taken for German officers, but fortunately friendly neighbours took Cohen and his wife into their house. In May 1942 he was obliged to wear the "yellow star" and became subject to the restrictions imposed on Jews. Matters came to a head in 1943, when on a visit to the laboratory he was arrested and taken to a prison in Amsterdam, the charge being that he had entered a "public" building. The many efforts of his friends to secure his release were unavailing, and Cohen was sent to the concentration camp at Vught in Holland. At a discussion of this state of affairs by the Council of the Dutch Chemical Society, it was proposed by Dr. Kappelmeier that an approach be made to the S.S. authorities at The Hague. This was successful, Cohen was released, and soon afterwards was freed from practically all the restrictions imposed on Jews. But the enemies of the Jews had not yet finished with him. On February 28th, 1944, a friend, having found out that an order for his arrest had come from Amsterdam to the Utrecht police, telephoned Cohen, who then, on good advice, moved to another friend's house (thus evading immediate arrest), and when night fell came to see Kruyt. Kruyt advised him strongly to "dive", and so give his many friends time to approach the German headquarters at The Hague. But this he refused to do, maintaining that he had done nothing wrong and that the whole affair must be due to some misunderstanding. Moreover, he refused Kruyt's advice to approach the S.S. headquarters at The Hague himself. Instead, he informed the Utrecht police of his whereabouts, was arrested and taken to Amsterdam, and on March 1st to Westerbork. Here further efforts were made by his friends to induce him to approach The Hague, but all in vain. The end was now not far off. All the evidence goes to show that on March 3rd he was transported (with many others) to the notorious "death" camp at Auschwitz and there murdered in a gas chamber (p. 677).



Fig. 1. E. J. Cohen (1869-1944) (“Ernst Julius Cohen”, 1902).

Cohen's works

The list of Cohen's works includes four hundred and twenty-four papers published over a 55-year period, from 1888 to 1943 (Kruyt, 1918, pp. 1452-1466; De Meester & Moesveld, 1927, pp. 489-522; Anonymous, 1939, pp. 519-522; Anonymous, 1945, pp. 128-129). These are the articles mainly published in the Netherlands, as well as in Germany, Great Britain and U.S.A., among other in the *Chemisch Weekblad*, *Vergaderingen Der Wis- En Natuurkundige Afdeeling*, *Recueil des Travaux Chimiques des Pays-Bas*, *Zeitschrift für Physikalische Chemie*, *Transactions of the Faraday Society*, *Journal of the Chemical Society*, *The Journal of the American Chemical Society*. The list of articles published by him in the years 1894-1943 was also presented by Frederick G. Donnan at Cohen's obituary (Donnan, 1948, pp. 678-687).

His first articles in Dutch from 1888-1891, “dealt with subjects relating to the art and science of photography” (Donnan, 1947, p. 1701), and “the chemistry of the photographic process” (Snelders, 2013), and in particular were devoted, among other, photographing, photographic negatives and photogrammetry (Kruyt, 1918, p. 1452).

In 1894, his first article in German related to his doctoral dissertation was published in the *Zeitschrift für Physikalische Chemie*. It was entitled *Die Bestimmung von Umwandlungspunkten auf elektrischem Wege und die elektromotorische Kraft bei chemischer Zersetzung* (The Determination of Transformation Points by Electrical Means and the Electromotive Force in the Case of Chemical Decomposition) (Cohen, 1894; Donnan, 1948, p. 678).

In 1899, two of his articles written with Cornelis van Eijk jr (1870-1940) entitled *De Enantiotropie van het Tin* (The Enantiotropy of Tin) was published (Cohen & van Eijk, 1899a; Cohen & van Eijk, 1899b). The results of further studies on this topic, he published

in the years 1899-1902 (Cohen, 1899a; Cohen, 1900a; Cohen, 1900b; Cohen, 1901a; Cohen, 1902).

In 1927, the Dutch chemist Alexander Lambertus Theodorus Moesveld (1892-1962) in his article entitled *Het Wetenschappelijk Werk Van Ernst Cohen In De Periode 1918-1927* (The Scientific Work of Ernst Cohen in the Period 1918-1927) generally described Cohen's scientific achievements during this period (Moesveld, 1927). Twenty-one years later his article entitled *The Scientific work of Ernst Cohen* was published in the *Journal of Chemical Education*. He wrote in it: The scientific work of Ernst Cohen was not restricted to a single field, but one particular subject was foremost in his thoughts: the study of physical isomerism. The research which gave him his doctor's degree was on the allotropy of tin and after his retirement from the chair of general chemistry he continued his work on the transformation of white into gray tin with undiminished vigor ... Two other domains of physical chemistry had a major interest for him: electrochemistry, often in close contact with studies of physical isomerism, but also in connection with the Weston standard cell; and piezochemistry, in which field he was the first to make accurate measurements up to rather high pressures (1500 atm.) (p. 308).

Cohen's article co-written with L. R. Sinnige entitled *Solubility Determinations up to 1,000 Atmospheres Pressure*, was read before Section X. of the Seventh International Congress of Applied Chemistry in London in 1909. It was published a year later in the *Transactions of the Faraday Society* (Cohen, 1910).

The Dutch chemist Wilem Derk Helderman (1889-1939) described Cohen's electrochemical studies in an article published in 1918 (Helderman, 1918). In the same year, A. L. Th. Moesveld, familiarized readers with the results of his experimental studies in the field of piezochemistry (Moesveld, 1918).

The Dutch chemist Theodorus Strengers (1879-1951) in his article entitled *Onderzoekingen Omtrent Allotropie Van Prof. Dr. Ernst Cohen* described Cohen's studies on allotropy (Strengers, 1918). The results of his experimental studies were published in a large number of articles, e.g. on phosphorus allotropy (Cohen & Olie, 1908), tellurium (Cohen & Kröner, 1910), bismuth (Cohen & Moesveld, 1913), cadmium (Cohen, 1918; Cohen & Helderman, 1913a; Cohen & Helderman, 1914a), zinc (Cohen & Helderman, 1913b; Cohen & Helderman, 1914b), copper (Cohen & Helderman, 1914c; Cohen & Helderman, 1914d), antimony (Cohen & Van den Bosch, 1914a; Cohen & Van den Bosch, 1914b), sodium (Cohen & Wolff, 1915a) and potassium (Cohen & Wolff, 1915b).

The Dutch chemist and historian of science Henricus Adrianus Marie Snelders (b. 1930), an emeritus professor of the history of natural science at the Utrecht University, in his 1997 book entitled *De Geschiedenis van de Scheikunde in Nederland. Deel 2. De ontwikkeling van chemie en chemische technologie in de eerste helft van de twintigste eeuw* (The History of Chemistry in the Netherlands. Part 2. The Development of Chemistry and Chemical Technology in the First Half of the Twentieth Century) wrote the following:

Cohen's systematic investigations into the nature and cause of allotropy, gave order to a jumble of factual material described in the literature. Cohen worked with some proven, in principle very simple measurement methods, but it required tough patience and perseverance (p. 65).

On June 13, 1911, Cohen delivered a lecture to the Faraday Society entitled *The Allotropy of Metals*, which was published in the Society's journal (Cohen, 1911a). Four years later, his paper under the title *The Influence of Allotropy on the Metastability of Metals, and its Bearing on Chemistry, Physics, and Technics* was published in the same

journal (Cohen, 1915).

In 1943, his last article entitled *De Nomenclatuur van enkele organische Zuren* (The Nomenclature of Some Organic Acids) was published in the *Chemisch Weekblad*. With for political reasons, his wife Wilhelma Abramina Titia Cohen-de Meester (Snelders, 1997, p. 66) appears as its author, however, this article belongs to fully to the works of Ernst Cohen (Anonymous, 1945, p. 129; Cohen-de Meester [Cohen], 1943).

Cohen's books on chemistry

Some of his books have been published in Dutch. One of them have been translated into German and English. He revised and enlarged one of the editions Jacobus Henricus van't Hoff's book. After his death, Cohen was one of the editors of the book with reprints of his articles and prepared another for publication. In addition, in one of the books a chapter was published which he wrote in German.

In 1896, Van't Hoff book under the title *Studies in Chemical Dynamics* was published. It was revised and enlarged by Ernst Cohen. The translator was T. Evan (Van't Hoff, 1896a). In the same year, the German edition of this book entitled *Studien zur chemischen Dynamik* was published in Leipzig (Van't Hoff, 1896b).

His book entitled *Experimentaluntersuchung Über Die Dissociation Gelöster Körper In Alkohol-Wassergemischen* (Experimental Study on the Dissociation of Dissolved Bodies in Alcohol-Water Mixtures) appeared in 1897 in Rotterdam (Cohen, 1897).

In 1901, his *Voordrachten Over Physische Scheikunde Voor Geneeskundigen* (Lectures on Physical Chemistry for Physicians) was published by F. Van Rossen in Amsterdam (Cohen, 1901b). In the same year, a German edition of this book entitled *Vorträge Für Ärzte Über Physikalische Chemie* appeared in Leipzig (Cohen, 1901c).

In 1903, an American edition of this book entitled *Physical Chemistry for Physicians and Biologists* (Figure 2) was published in New York (Cohen, 1903a) and an English edition of the same title appeared in London. The translator was Marin Henry Fischer (1879-1962); Instructor in Physiology at the University of California (Cohen, 1903b).

PHYSICAL CHEMISTRY

FOR

PHYSICIANS AND BIOLOGISTS

BY

DR. ERNST COHEN

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AUTHORIZED TRANSLATION FROM THE GERMAN

BY

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NEW YORK

HENRY HOLT AND COMPANY

1903

Fig. 2. Title page of E. Cohen's Physical Chemistry for Physicians and Biologists (New York: Henry Holt and Company, 1903).

In 1906, his book in German, written together with the Dutch chemist Peter van Romburgh (1855-1945), was published in Leipzig under the title *Vorlesungen Über Die Anorganische Chemie Für Studierende Der Medizin* (Lectures on Inorganic Chemistry for Medical Students) (Cohen & Van Romburgh, 1906).

His book written with Willem Schut (1881-1962) entitled *Piezochemie kondensierter Systeme* (Piezochemistry Condensed Systems) was published in 1919 in Leipzig (Cohen & Schut, 1919).

In 1926, his *Physico-chemical Metamorphosis and some Problems in Piezochemistry* was published in 1926 in New York (Cohen, 1926). One year later, the German edition of this book entitled *Physikalisch-chemische Metamorphose und einige piezochemische Probleme* appeared in Leipzig (Cohen, 1927a).

D. B. Keyes, in a review of the American edition of this book, published in the *Journal of Chemical Education* in 1927, wrote:

Dr. Ernst Cohen, University of Utrecht, is well-known in the United States not only through his great professional and scientific reputation but also because of the charm of his personality and his ability to entertain his audiences. It is, therefore, with a great deal of pleasure that we see the publication of Dr. Cohen's lectures at Cornell University. These lectures cover two subjects, one, physico-chemical metamorphosis, and the other piezochemistry. The text was originally written by Dr. Cohen in German and has been admirably translated into English by Dr. Audreith. Dr. Cohen in the first half of his book brings out clearly an unappreciated fact; to wit, that most solid substances, elements, or compounds are capable of existing in two or more physical forms. This is brought out by

numerous experimental investigations on various substances by the author and his co-workers. ...The second half of the book is concerned with piezo-chemistry, or the influence of very high pressures on volume, solubility, etc. ... The entire book is given over to two fields of specialized research but it is, nevertheless, both worthwhile and entertaining to the ordinary reader because the author has allowed some of his own charming personality to appear within the lines (pp. 548-549).

In 1927, his lecture *The Influence of Pressure upon Chemical Transformations* delivered in July, 1926 at Columbia University in New York was published (Cohen, 1927b; Behrle, 1928, pp. 1371-1372; Reinmuth, 1927, p. 1206). One year later, his book entitled *Uit het Land van Benjamin Franklin* (From the Land of Benjamin Franklin) was published in Zutphen (Cohen, 1928).

He and Heinrich Precht (1852-1924) were editors of the book with the results of van't Hoff's studies on the formation of the Stassfurt oceanic salt deposits, which he conducted in the years 1897-1908. This book contains 52 papers on this topic, written by van't Hoff himself and in collaboration with other chemists, and was published in 1912 after van't Hoff's death (Precht & Cohen, 1912).

He prepared for publication van't Hoff's book entitled *Die Chemischen Grundlehren Nach Menge, Mass und Zeit* (The Basic Chemistry According to Quantity, Measure and Time). The book was published in 1912 in Braunschweig after van't Hoff's death (Van't Hoff, 1912).

His chapter on tin (Sn) and its compounds was published in the book under the title *Handbuch der Anorganischen Chemie* in 1905 (Cohen, 1905).

Cohen's articles and books on the history of chemistry

He was the author of a large number of publications on the history of chemistry. Most of his articles were published in Dutch. His books were published in Dutch as well as in German and English.

In a 37-year period, from 1906 to 1943, twenty-four of his articles under the general title of *Chemisch-Historische Aanteekeningen* (Chemical-Historical Notes) were published in the *Chemisch Weekblad*. The first article from 1906, he began with words: When one studies the works and lives of those whose names may be regarded as immortal in the history of natural science, one is repeatedly reminded of Cuvier's words: "pour beaucoup de grands hommes le malaise a été le meilleur maitre [for many great men uneasiness has been the best teacher]." (p. 341).

He wrote in this article about the French chemist Joseph Louis Proust (1754-1826), the English chemist Joseph Priestley (1733-1784), the Swedish chemist Carl Wilhelm Scheele (1742-1786), the English chemist John Dalton (1766-1844) and many other famous chemists (Cohen, 1906).

In 1907, a second article entitled *Wie heeft de verbranding van een Horlogeveer in zuurstofgas het eerst uitgevoerd?* (Who was the first to burn a watch spring in oxygen gas?) was published (Cohen, 1907a). The third article under the title *Bijdrage tot de geschiedenis der uitvinding van den Luchtballon* (Contribution to the History of the Invention of the Hot Air Balloon) was published in 1909 (Cohen, 1909).

His article under the title *Hundert Jahre in der Molekularwelt* (A Hundred Years in the Molecular World) was published in 1911 in the *Zeitschrift für Elektrochemie* (Cohen, 1911b). Seven years later, he wrote article about life of the Scottish chemist Joseph Black (1728-1799) (Cohen, 1919). In 1923, his article about the French chemist Louis Pasteur (1822-1895) appeared in the *Chemisch Weekblad* (Cohen, 1923).

His article entitled *Uit het leven van Joseph Achille Le Bell* (From the Life of Joseph Achille Le Bell) was published in 1924 (Cohen, 1924a). In the same year, his article under the title *Vijftig Jaren Uit De Geschiedenis Eener Theorie* (Fifty Years from the History of One Theory) was published. In this article he described, among others Davy medals award ceremony to Jacobus Henricus van't Hoff and the French chemist Joseph-Achille Le Bell (1847-1930) on November 30, 1893 in London (Cohen, 1924b).

The content of two his articles from 1940 concerned the chemical auto-dafé (Cohen, 1940a) and the chemistry and chemical industry in Amsterdam over the centuries (Cohen, 1940b). In 1901, he wrote two articles about chemistry in Utrecht over the centuries (Cohen, 1941a; Cohen, 1941b).

In 1942, his article entitled *Het ontstaan der Substitutiethorie* (The Origin of Substitution Theory) appeared in the *Chemisch Weekblad* (Cohen, 1942a). In the same year, two of his articles were published: *Nieuwe Bijdragen tot geschiedenis van het Lachgas* (New Contributions to the History of Laughing Gas) and *Het Natuurkundig Genootschap der Dames te Middelburg (1785-1887)* (Cohen, 1942b0. Cohen & Cohen-de Meester, 1942c).

Charles Albert Browne's (1870-1947) article entitled *Dr. Ernst Cohen as Historian of Chemistry*, first presented before the Division of Chemical Education at the 109th meeting of the American Chemical Society in Atlantic City on April, 1946, was also published in 1948 in the *Journal of Chemical Education*. He wrote in it:

Next to the historical papers in his native language, Cohen published chiefly in German. Of the 50 reprints of his history of chemistry publications in my collection 27 are in Dutch, 21 in German, and two in English. Many of the German papers were simply his translations of the Dutch originals (p. 307).

His two biographical books in German about van't Hoff were published in 1899 and 1912 in Leipzig (Cohen, 1899; Cohen 1912).

In 1907, his *Das Lachgas. Eine Chemisch-Kultur-Historische Studie* (The Laughing Gas. A Chemical-Cultural-Historical Study) was also published in Leipzig (Cohen, 1907b).

In 1933, his book in Dutch, co-written with W.A.T. Cohen-de Meester under the title *Hugo Rudolph Kruyt, 1908-1933* was published in Amsterdam (Cohen & Cohen-de Meester, 1933). Three years later, their book entitled *Daniel Gabriel Fahrenheit (geb. te Danzig 24 Mei 1686, overl. te s-Gravenhage 16 Sept. 1736)* appeared in Amsterdam (Cohen & Cohen-de Meester, 1936). In 1939, their book was published under the title *Der vermisste Brief Antoni Leeuwenhoeks an Herman Boerhaave vom 26. August 1717* (Antoni Leeuwenhoek's Missing Letter to Herman Boerhaave on August 26, 1717) (Cohen & Cohen-de Meester, 1939). In 1941, their book entitled *Katalog der wiedergefundenen Manuskripte und Briefwechsel von Herman Boerhaave* (Catalog of the Recovered Manuscripts and Correspondence by Herman Boerhaave) was published in Amsterdam (Cohen & Cohen-de Meester, 1941).

CONCLUSION

Ernst Cohen (1869-1944) was an outstanding Dutch chemist and historian of chemistry of the second half of the XIX century and the first half of the XX century. He received many

scientific honours. Among them are a membership of the Academies of Sciences and the Scientific Societies. In 1913, he was appointed a member of the *Koninklijke Akademie van Wetenschappen* (Royal Academy of Sciences) (Snelders, 1997, p. 69). On December 6, 1924, he became a corresponding member of the Russian Academy of Sciences.

He became a member of the Dutch Chemical Society founded in 1903. He was also the first President of this Society (Donnan, 1947, p. 1705). In 1925, he became a corresponding member of the *Gesellschaft der Wissenschaften* (Society of Sciences) in Göttingen (Jorissen, 1927, p. 477). He was elected a Foreign Member of the Royal Society of London in 1926.

He was a member of the Council of the International Union of Pure and Applied Chemistry. He was elected a member of the International Committee responsible for the preparation of the *Tables Annuelles de Constantes et Données Numériques de Chimie, de Physique et de Technologie* (Annual Tables of Constants and Numerical Data for Chemistry, Physics and Technology) (Donnan, 1947, p. 1705).

He became an honorary member of the Chemical Society of London (1923), the Royal Institution in London (1925), the Romanian Chemical Society in Bucharest (1926), and the American Chemical Society (1926) (Jorissen, 1927, p. 477).

He was elected Doctor *honoris causa* of the universities of Cambridge, U.K. (1923), of Karlsruhe, Germany (1925), and of Philadelphia, U.S.A. (1926) (“Album Academicum. Professors”, n.d.).

After Cohen, not only his papers and books survived. In addition, several of his photos were produced. His photo taken in a chemical laboratory (“Cohen, Ernst Julius”, n.d. a) and a photo of his bas-relief with the inscription: “1902 / ERNST/ COHEN/ HOOGLERAAR [PROFESSOR] / TE [AT]/ UTRECHT / 1939” (“Cohen, Ernst Julius”, n.d. b) are from the Edgar Fahs Smith Chemistry Collection. His photos are also in the articles by F. G. Donnan (Donnan, 1947, p. 1700; Donnan, 1948, p. 667).

The photo of Cohen with the group of chemists can be found in the article by W. P. Jorissen (1927, p. 475) and in the article by C. A. Browne (1948, p. 303). It was taken during an International Chemical Meeting, which was held in Utrecht on June 23 and 24, 1921. Nine chemists participated in the meeting, incl. Dutch chemists Hugo Rudolph Kruyt and Peter Van Romburgh (1855-1945), Frederick G. Donnan, Austrian chemist Rudolf Wegscheider (1859-1935), Latvian–Russian–German chemist Paul Walden (1863-1957), and German chemist Rudolf Schenck (1870-1965).

Cohen, as one of the outstanding masters of physical chemistry, went down in the history of chemistry, and his name was written in it forever. Confirmation of this fact are the words of Frederick George Donnan (1947):

His famous researches in the fields of polymorphism, electrochemistry, thermochemistry, and piezochemistry, the excellent books he wrote, his many visits to other countries and the lectures he gave therein, and—last but not least—the important part he played in the national and international organisation and development of chemical science, made Ernst Cohen one of the most outstanding and well beloved men of science of his day and generation (p. 1700).

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