

the Cape, the gems of Ceylon and Burma are scattered to the uttermost ends of the world within three months, and the gems of the East go to the far West, until, as with civilization, there is no more West, or more correctly, the West is East, or rather they meet on the Pacific Coast.

Looking back on the past history of the gem traffic, as we have thus sought to outline it, we may say, that since the dawn of history the principal markets for the gathering and distribution of precious stones have been probably the following: Ancient India, Egypt, Babylon, Tyre, Alexandria, Rome, Byzantium, Venice, Augsburg, Golconda, Goa, Colombo, Ratnapura, Amsterdam, Antwerp, Paris and London. For the semi-precious stones and agates, Oberstein, in Germany, St. Claude, in the French Jura, and the great fair at Nijni Novgorod, in Russia, are the most important; and the United States is the ultimate home of from one-third to one-half of the world's product.

[The lecture was profusely illustrated throughout with the aid of lantern slides.]

IN MEMORIAM.

MATHEW CAREY LEA.

Our late member, M. Carey Lea, was the son of the distinguished naturalist, Isaac Lea, LL.D., and Frances A. Lea. His maternal grandfather was Mathew Carey, widely known as a publisher and writer on political economy. He was born August 16, 1823, being the second son of a family of three sons and a daughter, the eldest son dying in infancy. His brother, Henry C. Lea, the well-known publisher and writer upon historical subjects, still survives him at the age of 72. The father, who died in 1886, had reached the great age of 94.

The subject of this sketch was not sent to school or to college, but was given a very careful and thorough education by the best teachers procurable, under whose care his strong intellectual powers and retentive memory enabled him to acquire a culture at once broad and thorough in languages, literature, and the natural and physical sciences. His father's

eminence as a student of natural history, coupled with the possession of ample means, furnished exceptional opportunities for him, even as a boy, to acquire this broad culture. Thus, in 1832, when 9 years of age, he accompanied his parents to Europe, where they spent over six months in travel and making the acquaintance of the most eminent English and Continental men of science, with many of whom his father had been in correspondence for years.

He was destined for the legal profession, and studied under the late Wm. M. Meredith, then the leader of the Philadelphia bar, and was admitted to practice about the year 1847. Ill health, not long after, forced him to abandon the profession, and he spent some years in Europe in search of relief, but from that time he remained more or less an invalid, with repeated attacks of illness, which incapacitated him for the active pursuits of life.

Shortly after abandoning the legal profession he entered the laboratory of Prof. Jas. C. Booth, and there acquired that love of chemical research to which he devoted the remainder of his life.

The branch of science which attracted him especially was the chemistry of photography. His contributions to this branch of science were numerous, and some of them of such capital importance that they secured for him a world-wide recognition as one of the half-dozen pioneer investigators who have laid the scientific foundations of photography.

From 1870 to 1878 he contributed to the photographic journals many papers of much practical value to amateur photographers on methods of preparing collodio-bromide emulsions and developing agents. Among his earlier contributions was the investigation of the influence of color on the reduction by light of the iodide, bromide and chloride of silver. Of more recent date were his experiments with a series of the salts of silver (chiefly the chlorides), with the view of making use of them in obtaining photographs of objects in their natural colors, summarized in a paper on the photo-chemistry of the silver haloids, which has been pronounced the most valuable contribution to photographic chemistry made in a quarter of a century.

He is best known to the chemical world by his description of the photo-bromide and photo-iodide of silver and the discovery of the identity of these salts with the substance of the latent photographic image, and by his remarkable discovery of the allotropic forms of silver. This extremely interesting and valuable discovery, which was published but a few years before his death, gained for him the honor of election to the National Academy of Sciences. He published, as early as 1868, his "Manual of Photography," a second edition of which appeared in 1871.

Along with these scientific studies he kept up his interest in literary culture, and his intimate acquaintance with the classics, and with what is best in the literature of Europe, of England, France, Germany, Italy and Spain, with all of the languages of which he was familiar.

Mr. Lea united himself with the Franklin Institute in 1848, and with the Chemical Section shortly after its organization. Although never participating actively in the work of the Institute, he manifested his appreciation of its rich possessions of scientific serials by availing himself frequently of the special privileges which the Library Committee was pleased to accord him, in recognition of his devotion to scientific research. The value which he placed upon the advantages thus derived from his connection with the Institute was manifested in his bequest to the Chemical Section of his large and valuable collection of physical and chemical apparatus and material and scientific books, and a fund to provide (in perpetuity) for the purchase of books and periodicals devoted to physics and chemistry.

He was twice married, first to Elizabeth Jaudon, widow of William Woodhouse Bakewell, of Cincinnati, who died in 1881, leaving a son, George H. Lea, and, secondly, to Eva Lovering, daughter of the late Prof. Joseph Lovering, of Harvard University. His son and widow survive him.

His death occurred at his residence at Chestnut Hill, Philadelphia, on the 15th of March, 1897.

S. P. SADTLER,
JNO. CARBUTT,
WM. H. WAHL.

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M. CAREY LEA.

[1823-1897.]

APPENDIX.

LIST OF THE MORE IMPORTANT SCIENTIFIC PAPERS OF M. CAREY LEA.

Numerical Relations between Chemical Equivalents. *American Journal of Science*, vols. I and II, 1860.

Production of Ethylamine by Reactions of the Oxy-ethers. *American Journal of Science*, vol. II, 1860.

Sources of Error in the Detection of Potash. *American Journal of Science*, vol. I, 1861.

Production of Ethyl-bases. *American Journal of Science*, vol. II, 1861.

Exact Separation of Ethyl-Bases. *American Journal of Science*, vol. II, 1861.

Preparation of Ethyl Nitrate and Nitrite. *American Journal of Science*, vol. II, 1861.

Reactions of Ethylamine and Diethylamine. *American Journal of Science*, vol. I, 1862.

Production of Methyl-bases and Formation of Methyl Nitrate. *American Journal of Science*, vol. I, 1862.

On Methylamine. *American Journal of Science*, vol. I, 1862.

On Triethylamine. *American Journal of Science*, vol. II, 1862.

Arithmetical Relations of Chemical Equivalents. Influence of Ozone and other Chemical Agencies on Germination and Vegetation. *American Journal of Science*, vol. I, 1864.

Remarks on the Distillation of Substances of Different Volatilities. *American Journal of Science*, vol. I, 1864.

Notes on the Platinum Metals and their Separation from each Other. *American Journal of Science*, vol. II, 1864.

Notes on the Reactions of the Platinum Metals. *American Journal of Science*, vol. II, 1864.

Colored Derivatives of Naphthaline. *American Journal of Science*, vol. II, 1864.

Preparation of Oxalate of Ethyl. *American Journal of Science*, vol. I, 1865.

Reactions of Gelatine. *American Journal of Science*, vol. II, 1865.

Nature of the Invisible Photographic Image. *American Journal of Science*, vol. II, 1865.

Detection of Iodine. *American Journal of Science*, vol. II, 1866.

Nature of the Action of Light on Silver Iodide. *American Journal of Science*, vol. II, 1866.

New Manipulations. *American Journal of Science*, vol. II, 1866.

Influence of Organic and Inorganic Substances on Germination and Vegetation. *American Journal of Science*, vol. I, 1867.

Contributions toward a Theory of Photo-Chemistry. *American Journal of Science*, vol. II, 1867.

New Test for Hyposulphites. *American Journal of Science*, vol. II, 1867.

On Nitroglucose. *American Journal of Science*, vol. I, 1868.

Criticism on a Proposed Method of Estimating Ethylic Alcohol in Presence of Methyl. *American Journal of Science*, vol. I, 1872.

Influence of Color on Reduction by Light. *American Journal of Science*, vol. I, 1874.

- Laboratory Notes. *American Journal of Science*, vol. I, 1874.
- Nature of Action of Light on Silver Bromide. *American Journal of Science*, vol. I, 1874.
- Detection of Hydrocyanic Acid. *American Journal of Science*, vol. I, 1875.
- Action of the less Refrangible Rays on Silver Iodide and Bromide. *American Journal of Science*, vol. I, 1875.
- Influence of Color on Reduction by Light. *American Journal of Science*, vol. I, 1875.
- Explosive Properties of Methyl Nitrate. *American Journal of Science*, vol. II, 1875.
- Notes on Sensitiveness of Silver Bromide to Green Rays as Modified by other Substances. *American Journal of Science*, vol. I, 1876.
- Sensitiveness to Light of Various Salts of Silver. *American Journal of Science*, vol. I, 1877.
- On Certain New and Powerful Means of Rendering Visible the Latent Photographic Image. *American Journal of Science*, vol. II, 1877.
- Action of Certain Organic Substances in Increasing the Sensitiveness of the Silver Haloids. *American Journal of Science*, vol. II, 1877.
- Reactions of Silver Chloride and Bromide. *American Journal of Science*, vol. I, 1878.
- On Ammonio-argentic Iodide. *American Journal of Science*, vol. I, 1878.
- On Combinations of Silver Chloride and Iodide with Coloring Matters. *American Journal of Science*, vol. I, 1885.
- On Red and Purple Chloride, Bromide and Iodide of Silver. On Heliochromy and on the Latent Photographic Image. *American Journal of Science*, vol. I, 1887.
- Identity of the Photosalts of Silver with the Material of the Latent Photographic Image. *American Journal of Science*, vol. I, 1887.
- On Photo-bromide and Photo-iodide of Silver. *American Journal of Science*, vol. I, 1887.
- Image Transference. *American Journal of Science*, vol. II, 1887.
- Combinations of Silver Chloride with other Metallic Chlorides. *American Journal of Science*, vol. II, 1887.
- On Allotropic Forms of Silver. *American Journal of Science*, vol. I, 1889.
- On Allotropic Forms of Silver. *American Journal of Science*, vol. II, 1889.
- On the Properties of Allotropic Silver. *American Journal of Science*, vol. II, 1889.
- On Ring Systems and other Curve Systems produced on Allotropic Silver by Iodine. *American Journal of Science*, vol. II, 1889.
- On Gold-colored Allotropic Silver. *American Journal of Science*, vol. I, 1890.
- On Allotropic Silver. *American Journal of Science*, vol. I, 1891.
- On Allotropic Silver. (Read before the National Academy of Sciences, April 24, 1891, by Prof. Ira Remsen).
- On Allotropic Silver, Blue Silver, Soluble and Insoluble Forms. *American Journal of Science*, vol. I, 1891.
- Notes on Allotropic Silver. *American Journal of Science*, vol. II, 1891.