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George Sarton: The Father of the History of Science. Part 2. Sarton Shapes a New Discipline

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Introduction

The first part of this short biography focused on the early life of George Alfred Léon Sarton,¹ widely regarded as one of the key figures in the establishment of the history of science as a discipline in its own right. I examined the factors that influenced Sarton's philosophy concerning the interconnections between the two cultures of science and the humanities. According to F.S. Bodenheimer, Sarton called this philosophy "the new humanism." Embodied in his vision of the history of science was the synthesis of science and the humanities that would help make "scientists who are not mere scientists, but also men and citizens."²

As mentioned in Part 1, shortly after Sarton received his doctorate for his thesis on celestial mechanics, on June 22, 1911, he married Eleanor Mabel Elwes, the daughter of a Welsh civil and mining

engineer. The young couple established themselves in a picturesque country house in Wondelgem, near Ghent. There, Sarton's only surviving child, Eleanore Marie (later shortened to May) was born. There, too, Sarton founded the primary journal of the history of science, *Isis*, which he edited for 40 years, and began work on his mammoth *Introduction to the History of Science*.³

During these early years, it seemed as though Sarton's life and career had settled into a comfortable pattern. But the devastation of World War I shattered his scholarly idyll, forcing the Sartons to abandon their home in Belgium. They could take so little with them that the precious notes for Sarton's *Introduction to the History of Science* were stored in a metal trunk buried in his garden. However, a distant cousin later managed to dig up the notes and return them to Sarton after the war.

Sarton Emigrates

The Sartons first went to England, where George worked as a censor in the War Office. Although the flood of refugees from Belgium was welcomed, the War Office did not pay enough to support a family of three, and employment opportunities in the history of science were nowhere to be found. E.J. Dijksterhuis notes that the Italian historian of science, Aldo Mieli, offered Sarton the hospitality of his home at Chianciano, near Sienna.⁴ Instead, Sarton left his wife and child in England while he went to the United States in

search of a position that would support both his family and his dream of completing his *History of Science*. In September 1915, as May reveals in her memoir, *I Knew a Phoenix*, she and her mother, Mabel, completed the hazardous passage across the Atlantic and joined George at the New York home of Leo Baekeland, the eccentric Belgian inventor of Bakelite, the first successful plastic.⁵ (p. 86-91)

By good fortune, Sarton had reached the US at a time when the history of science was becoming a recognized activity. Robert K. Merton, Columbia, and Arnold Thackray,

University of Pennsylvania and present editor of *Isis*, note that although it was far from being an established discipline and was almost unthought-of as a profession, it was beginning to reach maturity.⁶ (p. 110) Nevertheless, Sarton endured an uncertain time in which he must have wondered whether or not he would have to abandon his dream of a life exclusively devoted to the history of science. Despite this, he turned down a good job as a librarian at Rice University, Houston, Texas, because the university could not meet the one condition about which he was adamant: that his employer take over the publication and financial support of *Isis*, which had been out of print since shortly after the invasion of Belgium.⁵ (p. 93)

The summer of 1916 found Sarton delivering a course of lectures at the University of Illinois, Urbana, and through *Isis* board member David Eugene Smith, among others, he soon received other appointments.⁴ In the same year, for example, he gave a series of six lectures on Renaissance science at the Lowell Institute in Boston, Massachusetts, and later was a lecturer at the George Washington University, Washington, DC.

Among those who helped Sarton arrange this frenetic but sustained round of temporary appointments was L.J. Henderson, a biochemist and a junior but influential member of the Harvard University faculty at Cambridge, Massachusetts.⁶ (p. 110) Henderson had been teaching a course on the history of science regularly since 1911 and supported Sarton's goals for the discipline. He managed to obtain an appointment for Sarton as a "lecturer in philosophy" at Harvard that extended until 1918, when the US involvement in World War I caused financial problems for the university.

A Permanent Position

In response to Sarton's renewed appeals for work, Robert S. Woodward, second president and successful organizer of the Carnegie Institution, Washington, DC, provided the crucial financial support for Sarton.⁶ (p. 110) Woodward had a personal interest in the history of science, and Sarton had been in touch with him even before the exile from Belgium. Although Woodward had initially been unsympathetic to Sarton's dream of establishing the history of science as a science in its own right, he had slowly softened his

position. With the help of Carnegie Institution trustee Andrew Dickson White, Woodward created the post of research associate in the history of science for Sarton. Characteristically, according to I. Bernard Cohen, a member of the board that assumed the duties of editing *Isis* when Sarton eventually stepped down, almost as soon as Sarton heard that he had secured a permanent position with a regular salary, he made plans to revive *Isis*, which had been dormant during the years of the war.⁷

Thus began Sarton's nearly lifelong association with the Carnegie Institution; but though he was employed on a full-time basis in Washington, he remained at Cambridge to study in the then-new Widener Library.⁶ (p. 110) When the war ended and he recovered his notes—which were greatly augmented by the mass of new data he had accumulated in the US—he found himself secure in one of the world's great libraries, with his salary guaranteed by the Carnegie Institution, and with no specific responsibilities or duties other than those he set for himself. He was free at last to pursue the mission that he had never forgotten.

Later Works

Sarton's sense of mission found its first, and perhaps best, expression in his most-cited work, the *Introduction to the History of Science*.^{3,8,9} The development of this work is a microcosm of the evolution of Sarton's concept of the unity of scientific and cultural endeavors. Sponsored by the Carnegie Institution, the *Introduction* has been cited in the *Science Citation Index*[®] (*SCI*[®]), *Social Sciences Citation Index*[®] (*SSCI*[®]), and the *Arts & Humanities Citation Index*[™] (*A&HCI*[™]) over 150 times from 1955 through 1984. It was not conceived as a work of historical narrative, but rather as a bibliography that would serve as the basic source material for such a history.¹⁰ It would deal with all science, covering the enterprise from its earliest beginnings up through the twentieth century. Sarton at first imagined that it would be a relatively short work.

Gradually, there emerged the concept of a colossal work that would consist of three series of books. The first would survey cross-sections of civilization by half-centuries; the second would deal with different types of civilizations; and the third would discuss, in de-

tail, the histories of various "special" sciences. The entire work would comprise some 26 volumes, but Sarton lived to complete only the first three volumes of the first series.⁴

The first of these volumes, *From Homer to Omar Khayyam*,³ was published in 1927 and contained 840 pages. It represents nine years of active work and covered the period from Homer through the eleventh century. The second volume took another four years to complete. Published in 1931 in two large parts consisting of a total of 1,252 pages, it was titled *From Rabbi Ben Ezra to Roger Bacon*⁸ and covered the twelfth and thirteenth centuries. The third volume,⁹ also printed in two parts, did not appear until 1947; when it did, it was apparent that the project could not continue, for it covered only the fourteenth century and had a total of 1,018 pages. As reported in a 1956 obituary printed in the *British Medical Journal*, Sarton estimated that a similar work dealing with the fifteenth century would have taken him 10 to 15 years to write.¹⁰

During the course of his labors on the *Introduction*, Sarton found himself hampered by his lack of knowledge of Arabic.¹¹ Spending the academic year 1931-1932 in the Near East, he eventually taught himself to read classical and modern Arabic. Sarton also knew some Hebrew, Chinese, and Portuguese and was familiar with Latin and Greek. He was fluent in French, English, German, Italian, Dutch, Flemish, Swedish, Danish, Turkish, and Spanish. In 1936, he found the time to begin a companion journal to *Isis*, and he named it *Osiris*. The purpose of the journal was to publish articles that were too long for *Isis* but not quite comprehensive enough to become a book. Sarton edited 10 volumes of this new journal.

In 1940, J.B. Conant, President of Harvard, elevated Sarton from his position of lecturer, which was an annual appointment, to tenured professor of the history of science.⁶ (p. 112) However, Sarton continued to draw the major portion of his salary from the Carnegie Institution, which also provided Sarton with a research and travel budget, money for the purchase of books and periodicals, and full-time secretarial assistance. When Sarton had published what would prove to be the last volume of his great introduction, he resolved to write the lectures that he had been giving for so many years at Harvard. He planned to complete the project in nine volumes, but

again the task eluded him. He published two: *A History of Science. Ancient Science through the Golden Age of Greece*,¹² cited 60 times from 1955 through 1984, and *A History of Science. Hellenistic Science and Culture in the Last Three Centuries B.C.*,¹³ cited about 45 times from 1955 through 1984. Ironically, although Sarton had been wont to say that his real interests lay in the modern period, when he died, the bulk of his published work covered antiquity and the Middle Ages.¹⁰

Honors and Awards

Among the honors bestowed on Sarton were the Prix Binoux of the Académie des Sciences, Paris, in 1915 and again in 1935, and the Charles Homer Haskins Medal of the Medieval Academy of America in 1949. He was made a Knight of the Order of Leopole in his native Belgium in 1940 and was granted numerous honorary degrees from such institutions as Brown University, Harvard University, and Goethe University, Frankfurt am Main, FRG. The scholarly honor societies to which he belonged include the American Academy of Arts and Sciences, the American Philosophical Society, the Royal Society of Edinburgh, the Royal Flemish Academy of Belgium, and the Arabic Academy of Damascus. A founding member of the International Academy of the History of Science, he also served as President of the International Union of the History of Science and Honorary President of the History of Science Society. In addition, he claimed honorary membership in the history of science societies of Belgium, England, Holland, Germany, Israel, Italy, and Sweden.¹¹

The honor that gave Sarton the most pleasure was the award of the George Sarton Medal, which he was the first to receive. On the occasion of Sarton's retirement as editor of *Isis* in 1952, a committee under the chairmanship of Frederick G. Kilgour, then of the Yale Medical Library, secured funds from Charles Pfizer and Company, a pharmaceutical and chemical manufacturing firm in New York, for a medal to be struck in Sarton's honor.¹⁴ The obverse of the medal features a profile of Sarton, while on the reverse is a figure of the goddess Isis, copied from a drawing made by Sarton's late wife for her husband's bookplate. The medal bears the inscription, "To further the history of science."

The Council of the History of Science Society, which sponsors the award, felt that there was no person to whom the medal might be more appropriately awarded than to George Sarton himself.¹⁴ In making the award, Dorothy Stimson, President of the Society said, "It is most fitting that the George Sarton Medal, named in Dr. George Sarton's honor, and to be awarded to those who have made an outstanding contribution to the history of science, should go first to Dr. Sarton himself.... Dr. Sarton has established, to a greater extent than anyone else, our present foundations of knowledge and understanding of the history of science. This he has achieved through more than 40 years as a pioneering, dynamic scholar and editor. He is truly the dean of the historians of science in this country."¹⁴ Table 1 lists the subsequent winners of the medal.

In 1960, the History of Science Society, under the auspices of the American Association for the Advancement of Science (AAAS) also established the George Sarton Memorial Lecture. The first lecturer was René Dubos;

Table 1: Past winners of the Sarton Medal, presented from 1955 to 1984.

1955	George Sarton
1956	Charles and Dorothea Waley Singer
1957	Lynn Thorndike
1958	John F. Fulton
1959	Richard Shryock
1960	Owsei Temkin
1961	Alexandre Koyré
1962	E.J. Dijksterhuis
1963	Vassili Zoubov
1964	Not awarded
1965	J.R. Partington
1966	Anneliese Maier
1967	Not awarded
1968	Joseph Needham
1969	Kurt Vogel
1970	Walter Pagel
1971	Willy Hartner
1972	Kiyosi Yabuuti
1973	Henry Guerlac
1974	I. Bernard Cohen
1975	René Taton
1976	Bern Dibner
1977	Derek Whiteside
1978	A.P. Youschkevitch
1979	Maria Luisa Righini-Bonelli
1980	Marshall Clagett
1981	A. Rupert Hall Marie Boas Hall
1982	Thomas S. Kuhn
1983	Georges Canguilhem
1984	Charles C. Gillispie

subsequent lecturers have included Ernst Mayr (1971), Thomas Kuhn (1972), I. Bernard Cohen (1978), Henry Guerlac (1982), Derek John de Solla Price (1983), and Arnold Thackray (1984). The speaker for 1985 will be Daniel Kevles. Table 2 lists each of the Sarton lecturers and their topics since the annual AAAS talk was renamed in Sarton's honor.

Yet despite the honors and accolades Sarton accumulated by the end of his career, his influence during his lifetime was relatively limited. According to Thackray and Merton, Harvard's administration considered Sarton a "...marginal, if illustrious, man. In 1940, he had still to produce his first successful PhD candidate, his undergraduate courses remained small, and he almost completely avoided all committee service and routine academic administration."⁶ (p. 112)

Although Sarton's influence on the history of science may not be immediately obvious, it is nonetheless real. His emphasis on critical bibliography, his instigation of sweeping surveys of the vistas of science, the journal he founded and, above all, his classic *Introduction to the History of Science*, all served to create the elements required by a struggling new field, as opposed to methods to be emulated or finished products for display.⁶ His presence at Harvard was instrumental in the creation of what later became one of the leading centers of the history of science in the world. And, at least part of the reason for Sarton's lack of influence was that, during the greater part of his career, there were no departments of the history of science, and therefore no jobs. However, though the outward face of the history of science today may show little trace of Sarton's influence, the bony foundation across which that skin is drawn was assembled through his efforts.

Death of Sarton

George Sarton died at 7:30 a.m. on March 22, 1956, of congestive heart failure. He appeared to have been in excellent health and was eagerly anticipating a visit to Montreal, where he was to give a lecture at McGill University on "The History of Science and the New Humanism."¹⁵ A few minutes after departing from his home in Boston for the airport, however, he felt ill and asked the taxi-cab driver to turn back. He died only a few minutes after he reached his house, while sitting in his favorite armchair. A simple funeral

Table 2: George Sarton memorial lecturers and topics, presented from 1960 to 1985.

1960	René Dubos Rockefeller University The scientist and the public
1961	Joseph Kaplan University of California, Los Angeles The International Geophysical Year
1962	Gerald L. Holton Harvard University The three types of scientific hypothesis: toward a program of thematic analysis
1963	Hudson Hoagland Worcester Foundation for Experimental Biology, Shrewsbury, MA Science and the new humanism
1964	Lloyd G. Stevenson Yale University Strangers and kindred: the history of science and the history of medicine
1965	Stillman Drake Municipal Financing Consultant, San Francisco, CA The Accademia dei Lincei (1603), the forerunner of modern academies of science
1966	George Wald Harvard University Color vision: model and reality
1967	Cyril Stanley Smith Massachusetts Institute of Technology The revival of qualities, corpuscles, and phlogiston in the modern science of materials
1968	Owsei Temkin Johns Hopkins University Historical reflections on the scientist's virtue
1969	Martin J. Klein Yale University Boltzmann, monocycles, and mechanical explanation
1970	G. Evelyn Hutchinson Yale University Attitudes towards nature in medieval England: the Alphonso and Bird Psalms
1971	Ernst Mayr Harvard University From catastrophism to evolutionism: the history of a conceptual tradition
1972	Thomas Kuhn Princeton University Mathematical versus experimental traditions in the development of physical science
1973- 1975	No lectures
1976	Joseph Fruton Yale University The emergence of biochemistry
1977	Jane Oppenheimer Bryn Mawr College A biologist looks at history

1978	I. Bernard Cohen Harvard University The concept of revolution in science
1979	George White University of Illinois Foundations of American geology
1980	Charles C. Gillispie Princeton University Is the inwardness of science extraneous to its history?
1981	Richard S. Westfall Indiana University A scientific life in the 17th century: the career of Isaac Newton
1982	Henry Guerlac Cornell University Why edit scientific classics?
1983	Derek J. de Solla Price Yale University Sealing wax and string: a philosophy of the experimenter's role in the genesis of high technology
1984	Arnold Thackray University of Pennsylvania The historian's calling in the age of science
1985	Daniel Kevles California Institute of Technology God, man, and genetics: historical reflections

service, which, in accordance with Sarton's wishes, was identical to that held for his wife some six years earlier, took place two days after he died, in the Harvard Memorial Church.

Charles and Dorothea Singer note that Sarton has been called a great teacher, a superb organizer of facts, and an unrivaled integrator of knowledge.¹⁶ "His erudition was such that even his informal comments were based on exact knowledge and frequently opened new leads for the author of a paper under discussion," Stimson wrote a year after Sarton died. "The encyclopedic range of his writings led the way to fresh and fertile fields for other scholars."¹⁷ Bodenheimer, in an obituary for Sarton in *Archives Internationales d'Histoire des Sciences*, wrote, "He was a good man...a courageous man...a wise and reasonable man...a great scientist...(and) a great humanist..."¹⁸

During the presentation of the first George Sarton Medal, Sarton had this to say about himself and his career: "Scholars of a later age reviewing my life will sometimes wonder whether I was crazy; I was not crazy, but seemed to be, because I was overwhelmingly dominated by two passions, a passion for science and another equally ardent one for the

humanities.... [I]t is impossible to live reasonably without science, or beautifully without arts and letters. He who studies the history of science and teaches it should always remain in touch with the living science of his own time.... [T]he past cannot be separated from the present without grievous loss. The present without its past is insipid and meaningless; the past without the present is obscure. The life of science, like the life of art, is eternal, and we must view it from the point of view of eternity."¹⁴

George Sarton was a remarkably gifted and versatile scholar who had exceptional organizational ability and a seemingly endless capacity for work. He also had a broad streak of idealism, conceiving a lofty view of humanity

and its essential reason for existing and rejoicing in that heritage, which he took every opportunity to proclaim. He has come to epitomize the history of science to scholars throughout the world, and the imposing number of books, articles, and lectures he produced in the more than 45 years he devoted to his field stand as a monument as much to his determination and faith as to his scholarship.

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REFERENCES

1. **Garfield E.** George Sarton: the father of the history of science. Part 1. Sarton's early life in Belgium. *Current Contents* (26):3-9, 24 June 1985.
2. **Bodenheimer F S.** George Sarton. *Arch. Int. Hist. Sci.* 9:295-8, 1956.
3. **Sarton G.** *Introduction to the history of science. From Homer to Omar Khayyam.* Baltimore, MD: Williams & Wilkins, 1950 (1927). Vol. I.
4. **Dijksterhuis E J.** Obituaries: in memoriam George Sarton. *Centaurus* 4:369-81, 1956.
5. **Sarton M.** *I knew a phoenix.* New York: Rinehart, 1959. 222 p.
6. **Thackray A & Merton R K.** Sarton, George Alfred Léon. *Dictionary of scientific biography.* New York: Scribner, 1975. Vol. 12. p. 107-14.
7. **Cohen I B.** George Sarton. *New Yorker* 29:286-300, 1954.
8. **Sarton G.** *Introduction to the history of science. From Rabbi Ben Ezra to Roger Bacon.* Baltimore, MD: Williams & Wilkins, 1950 (1931). Vol. II.
9. ----- *Introduction to the history of science. Science and learning in the fourteenth century.* Baltimore, MD: Williams & Wilkins, 1953 (1947). Vol. III.
10. **Anonymous.** Obituary: George Sarton. *Brit. Med. J.* 1(Pt.2):865, 1956.
11. **Cohen I B.** George Alfred Léon Sarton, (1884-1956). *American Philosophical Society Year Book, 1956.* Philadelphia: APS, 1957. p. 124-8.
12. **Sarton G.** *A history of science. Ancient science through the Golden Age of Greece.* Cambridge, MA: Harvard University Press, 1952. 646 p.
13. ----- *A history of science. Hellenistic science and culture in the last three centuries B.C.* Cambridge, MA: Harvard University Press, 1959. 554 p.
14. **Anonymous.** The George Sarton Medal. *Isis* 47:31-4, 1956.
15. **Editorial Committee.** George Sarton, 1884-1956. *Isis* 47:99-100, 1956.
16. **Singer C & Singer D.** George Sarton and the history of science. *Isis* 48:306-10, 1957.
17. **Stimson D.** Dr. Sarton and the History of Science Society. *Isis* 48:283-4, 1957.