



**“The Circle of Knowledge”,  
Applied Sciences at King's College  
And the Founding of the Samuel Johnson Medal  
June 30, 2014**

The 150 year anniversary of the founding of the School of Engineering provides an opportune time for all members of the Columbia community to take a closer look at the tradition of applied sciences at this institution. What we can see is that applied sciences did not spring forth out of a vacuum as a separate intellectual frontier 150 years ago. It was an inevitable response to a founder’s holistic vision of a complete education dating much further back.

Samuel Johnson, the first president of King’s College, spent a considerable amount of his lifework in categorizing the entire body of knowledge as known at that time, “...a drawing up of a satisfactory map of the intellectual world...”<sup>1</sup> We do not see scholarly efforts of categorization of knowledge in practice much today. However, there is a long history of concern with such matters from Plato to Peter Ramus (1515-1572), whom Samuel Johnson studied extensively. The original name for this type of work is derived from the Greek word for “encyclopedia” and means the circle or cycle of knowledge.<sup>2</sup> Johnson, born just at the close of the European Renaissance period, clearly believed a learned person should be “well-rounded”<sup>3</sup>, an idiom originating from the concept of encyclopedia.

Traditionally, these categorizations placed science in the realm of theory and art in the realm of practice. To grossly condense Samuel Johnson’s view of knowledge, we can see in his schematics and charts the following branches: Grammar, Rhetoric, Logic, Mathematics, Physics, Chemistry, Medicine, Philosophy and Theology. It is easy to envision a natural progression along a broad vista of knowledge passing through each of these subjects and back around again.

Clearly, this expansive mindset provided the framework for Samuel Johnson to advertise the opening of King’s College as follows:

*“...to instruct and perfect youth in the learned languages, and in the arts of reasoning exactly, of writing correctly, and speaking eloquently; and in the arts of numbering and measuring, of surveying and navigation, of geography and history, of husbandry, commerce and government, and in the knowledge of all nature in the heavens above us, and in the air, water and earth around us, and the various kinds of meteors, stones, mines and minerals, plants and animals, and of everything useful for the comfort, the convenience and the elegance of life, in the chief manufactures relating to*

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<sup>1</sup> Fiering, N. (2002), *President Samuel Johnson and the Circle of Knowledge*, p. 200.

<sup>2</sup> *Ibid*, p. 199.

<sup>3</sup> *Ibid*, p. 200.



*any of these things; and finally, to lead them from the study of nature to the knowledge of themselves, and of the God of nature, and their duty to Him, themselves, and one another, and everything that can contribute to the true happiness, both here and hereafter."*<sup>4</sup>

It is certainly no coincidence that this sweeping educational vision bridges all of the major categories identified by Samuel Johnson in his encyclopedias - but with a decidedly utilitarian slant. "On paper, no other American institution of learning appeared as anxious as was Columbia to adjust itself to utilitarian needs".<sup>5</sup> While in practical terms, the earliest courses of instruction could not live up to this ambitious agenda, by the end of the 18<sup>th</sup> century Columbia had one of the most complicated and extensive structures of any American college.<sup>6</sup> "Before 1800 twenty-six differently described departments of knowledge appear in the records".<sup>7</sup> Of these, 16 were in the sciences and applied sciences such as botany and medicine. And as at least one historian has noted, "This sweeping utilitarianism of the founders reappeared later in its pioneer(ing) school of mining..."<sup>8</sup>

At this point in the story, every engineer or engineer wannabe may recognize something vaguely familiar in this historical account. To achieve lasting excellence, the practice of engineering owes much to the systematic application of a vision, framework or process to achieve an objective at hand. In much the same way, with his training and research in creating a 'map of the intellectual world', Samuel Johnson appears to have been amply qualified to create an enduring community of learning with bold ambitions. Perhaps we can think of him as an 'education engineer' of sorts.

With his legacy of an ambitious agenda for this institution, it might have been easy to understand how Columbia evolved into a university renowned for its Core Curriculum and its breadth of outstanding professional schools. It all appears to have been her destiny, deriving from a culture founded on a longstanding preoccupation with excellence and unbiased appreciation for the widest possible scope of knowledge. For example, it's difficult to imagine Samuel Johnson's opening mandate ("*...to instruct and perfect youth in the learned languages, and in the arts of reasoning exactly, of writing correctly, and speaking eloquently...*") having a more well-crafted response than what would eventually be the Core Curriculum at Columbia. Furthermore, the passage continues by charging Columbia's future leaders to think broadly about knowledge with a preference to pursuing that which improves the human condition and our inner soul – a standard which has been met many times over, even as its pursuit continues unabated. Simply stated, we might expect that here at Columbia we see once again, founders and founding documents do demonstrably matter in the life and character of an institution.

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<sup>4</sup> Schneider, H. and C., ed. (2002) *Samuel Johnson: His Career and Writings* (Vol. 4), pp. 223-224.

<sup>5</sup> Hornberger, T. (1945), *Scientific Thought in the American Colleges (1638-1800)*, p. 30.

<sup>6</sup> *Ibid*, pp. 9, 31-33.

<sup>7</sup> *Ibid*, p. 31.

<sup>8</sup> *Ibid*, p. 33.



However, as detailed in the recently published history of the engineering school written to commemorate its 150 year anniversary, a richer and more nuanced story emerges<sup>9</sup>. We see that Samuel Johnson's ambitious vision was indeed executed as intended - broadly speaking. Columbia did develop with an eye toward excellence and unbiased appreciation for the widest possible scope of knowledge; and for this Johnson's legacy will always be assured. Yet beginning almost immediately after his presidency, this development was uneven at best, especially as it relates to her emphasis on the applied sciences in the making of a well-rounded person. It would take 100 years for Columbia to re-introduce the importance of applied sciences when it founded her School of Mines, albeit the first of its kind in the nation. And there would be subsequent highs and lows for this future school of engineering. Instead, for most of its history Columbia would have a stronger emphasis on the humanities and pure sciences.

Yet, we can see more clearly today than ever before that engineering and the applied sciences are central and in fact critical to the mission of the university, coinciding at a time when the school has never been stronger. This would not have been a surprise to Samuel Johnson and it should not be for us as well. For as foretold at the outset, to achieve its high ambition the mission of this university must include in large measure *everything useful for the comfort, convenience and elegance of life and the manufactures thereof*. Here we see once again that the vision of a man with an overarching perspective has proven quite prescient against the test of time. Namely, that the ability to reason exactly and communicate well is critical to define the issues that are important to humanity. But it reaches its highest expression when married with the practical abilities to solve problems and manufacture change.

Today, to convey the idea of the well-rounded Renaissance man applying their training in fields beyond their formal education, the School of Engineering bestows the Samuel Johnson Medal to its most accomplished alumni. It is for recognition of the highest achievement across the entire arc of human endeavor wherever rigor and methodical thinking and actions are applied beyond the traditional fields of science and engineering. Such fields may include education, law, public affairs, business, social sciences, architecture and the arts - whether it is in commerce, public service or academe. Indeed, Rev. Samuel Johnson, a Yale-educated philosopher who achieved lasting greatness as an educator, may forever be its finest exemplar for a medal that now carries his name.

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Samuel Johnson Medal Committee, Chair  
Columbia Engineering Alumni Association (CEAA), Past President  
Columbia University Senate – Alumni Senator

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<sup>9</sup>McCaughey, Robert (2014) *A Lever Long Enough: A History of the School of Engineering and Applied Sciences of Columbia University in the City of New York (1864-2014)*



BIBLIOGRAPHY:

1. Fiering, Norman S., President Samuel Johnson and the Circle of Knowledge, The William and Mary Quarterly, 3<sup>rd</sup> Ser., Vol. 28, No. 2(Apr., 1971), 199-236.
2. Hornberger, Theodore, Scientific Thought in the American Colleges (1638-1800), The University of Texas Press, Austin 1945.
3. McCaughey, Robert, A Lever Long Enough: A History of the School of Engineering and Applied Sciences of Columbia University in the City of New York (1864-2014), Columbia University Press, New York 2014.
4. Schneider, Herbert and Carol, ed. Samuel Johnson: His Career and Writings (Vol. 1-4), Thoemmes Press, Bristol 2002.