

Economics, Christianity, and Creative Evolution:
Peirce, Newcomb, and Ely and the Issues Surrounding the
Creation of the American Economic Association in the 1880s

James R. Wible

Department of Economics
Whittemore School of Business and Economics
University of New Hampshire
Durham, NH 03824

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Abstract

An exploration of the broader strands of intellectual currents in America in the late 19th century reveals an extraordinary and previously unrecognized response to the conceptual issues raised as the American Economic Association was founded in the 1880s. The evolutionary metaphysical essays of Charles Sanders Peirce in both The Monist and The Open Court essays of the early 1890s were written, in part, as a response to the philosophical, scientific, and religious positions taken by the leading figures of the economics profession during that historical episode. The controversies among economists, known as the new and old schools of political economy, constituted an American methodenstreit which mostly took place in the pages of Science. Simon Newcomb, a life-long scientific colleague and nemesis of Peirce, was the leading figure of the old school and Richard Ely, a younger colleague of both Newcomb and Peirce's at Johns Hopkins was the most prominent figure of the new school of political economy. In The Monist series, in its last article, "Evolutionary Love," Peirce criticizes Newcomb's political economy as an eros of lower purposes. In contrast, Peirce maintains that human social evolution can be driven by higher purposes calling such a conception of processes of change agapastic evolution. Agapastic evolution is a logical generalization of the moral principles of Christianity. In The Open Court series, Peirce takes another step and develops the notion of a logically and morally trained, self-sacrificing science advisor who functions like a critic of government policies. These are the types of individuals who Peirce thinks should govern us.

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1. Introduction
2. Evolutionary Love
3. Critique of Newcomb's Principles of Political Economy
4. Newcomb's Critique of American Political Economy, Science, and Religion
5. Newcomb's Interests in Economics
6. Newcomb and the New School Economists
7. The Social Gospel and the Founding of the American Economic Association
8. A Pythagorean Brotherhood of Self-Sacrificing Science Advisors
9. Conclusions

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Two gospels are current in our day. One is the gospel of Christ. It proclaims that God is Love; that Love it is that is the creative, the vivifying, the evolutionary principle of the universe; and that if we can only enter into the spirit of Love, so as to see how it acts and to put our trust in it, then we shall be able to bring about a new stage of man's development. The other gospel is the gospel of political economy and of natural selection. It teaches that the great engine of all advance, the redeemer of the world, is the combination of bestial passion, ruthless selfishness, and famine to exterminate the weak. Now there are plenty of people in this world silly enough to try to accept both gospels together.

C. S Peirce, "Dmesis," (1892f, p. 35).

1. Introduction

More than a century ago in the 1880s and 1890s, as the economics profession in the United States was being founded it also went through a highly contentious methodenstreit, a clash over the appropriate conception of science in which economics should be conceived and developed. That clash is now framed as a dispute between the old and new schools of political economy. The old school was mechanistic and empiricist in its conception of science and favored most of the tenets of British classical political economy. The new school was evolutionary, perhaps Hegelian in outlook and favored the theories of the economists of the German Historical School. On top of all of this, many of the new school economists were ministers or sons of ministers and sought to create a more Christian economics.¹ The new school economists founded the American Economic Association (AEA) in 1885. They argued for a larger role for the state in the American economy maintaining that workers needed to be supported by government policies and unions against the large corporations that were emerging in the post Civil War period in the United States. They also argued for greater regulation of large corporations and public utilities and for anti-trust legislation. Many of the new school economists were intrigued with socialism. At one point there was a concern that the AEA might become a socialist organization. In contrast, the old school economists held that economics as a science should be independent of explicit commitments to any religious framework. They argued that any view of economics that could be presented scientifically should be welcomed within the AEA. Over the first ten years of its existence, the AEA became more secularized, but evolutionary economists later known as American institutionalists increasingly dominated American

economics. By the mid 1890s, many of the old school economists had also joined the AEA and it was open to a variety of views on the role of the state in the economy and the relation of economics to religious concepts.

While the story of the origin and creation of the AEA has been explored by others, there was another response to the issues in this American *methodenstreit* which has gone unrecognized for about a hundred and twenty years. In the discipline of American philosophy can be found the outlines of a response to the scientific disagreements between the old and new schools of political economy. In one of the most well-known sets of essays on an evolutionary philosophical system, one can find direct comments on some of the issues dividing the old and new schools of political economy. At the same time that America was searching for its own place in the discipline of economics, American philosophy began its own unique approach to philosophy known as pragmatism. The best known of the pragmatists were Charles Sanders Peirce, William James, and John Dewey. Peirce was older and better trained in science, philosophy and mathematics than William James. Of course James became nationally prominent in psychology and philosophy at Harvard. Dewey took a class from Peirce at Johns Hopkins in the 1880s and acknowledged more of Peirce's influence later in life. Dewey became America's best known philosopher for the first few decades of the 20th century.

Peirce and James participated in a now famous sequence of informal meetings where American pragmatism is now considered to have originated. They met to discuss the major problems of philosophy in Cambridge, Massachusetts in the early 1870s in a series of meetings they called the Metaphysical Club. At Johns Hopkins in the 1880s Peirce started a philosophy seminar which also took the name of the Metaphysical Club. Both Metaphysical Clubs debated the major conceptions of philosophy and science – the rationalist positions of the German philosophers and the empiricist ideas of the British thinkers many of whom were also noted economists. The Metaphysical Clubs were also venues for considering the consequences of Darwin's theory of evolution on the British and German schools of philosophy and also on Christian theology. Peirce extended his conception of evolution beyond the biological domain. Peirce was also an astronomer. His conception of evolution also included the evolution of the cosmos and our planet Earth as part of that developing cosmos. In the late 1800s, the idea that our Milkyway Galaxy and our planet had evolved from a cloud of primordial dust was known as the nebular hypothesis. At the Johns Hopkins Metaphysical Club when Peirce presented one of his most famous lectures, "Design and Chance," outlining some of the key principles of his evolutionary philosophical system, John Dewey was present in the audience.

In the early 1890s, Peirce published a well known series of articles which are considered to

be classics in American philosophy. In what was then a new journal in philosophy, The Monist, Peirce published five major articles and a reply, outlining how a new evolutionary philosophy could be constructed. This group of articles is often known as The Monist metaphysical series. In the last article of the series, “Evolutionary Love,” Peirce outlined three approaches to conceptions of evolution. Cosmic development is governed by mechanistic forces, by chance, and by higher purposes once intelligent human beings become prominent on the planet. Peirce assigned Greek names to the three modes of evolution. For evolution impacted by higher purposes, Peirce chose the Christian name agape and termed such processes as agapastic evolution. In this same article, Peirce took several pages to criticize political economy and Simon Newcomb’s Principles of Political Economy. The debate over Newcomb’s Principles in 1884 and 1885 had helped to ignite the American methodenstreit. Newcomb was a prominent old school economist who sided with big business and finance in his policy views. Newcomb was also one of the nation’s most prominent astronomers, an adversary of Peirce’s for many years, and a member of the Johns Hopkins faculty. Newcomb not only criticized Peirce, but also the views of Richard Ely. Ely was Johns Hopkins first full-time economist and the most instrumental figure in the founding of the American Economic Association.

2. Evolutionary Love

Comments by Peirce on political economy appear near the beginning of his article “Evolutionary Love.” That article is the last of a series outlining the major features of an evolutionary metaphysical system. Without any economic or historical context, “Evolutionary Love” may be quite puzzling to the modern reader. There is an introduction offering broad philosophical and Christian themes for thinking about evolution. Then there is a section of several pages of themes critical of political economy which is highlighted by remarks on Newcomb’s Principles. The bulk of the article consists of Peirce’s portrayal of the three evolutionary processes by which the natural and social worlds have developed.

The article begins with several paragraphs making broad claims that both philosophy and Christianity in differing ways “proclaim the great evolutionary agency of the universe to be Love.”² After mentioning concepts about, eros, one of the Greek conceptions of love, Peirce offers his interpretation of New Testament passages written by St. John claiming that “God is Love.” Peirce alludes to several of the books of the Bible attributed to St. John by various biblical scholars. At one point, Peirce contrasts the more optimistic vision of God in St. John’s writings with the more pessimistic vision of God in Ecclesiastes:

Nevertheless, the ontological gospeller, in whose days those views were familiar topics, made the One Supreme Being, by whom all things have been made out of nothing, to be cherishing-love....The question is rather what the sane John thought, or ought to have thought, in order to carry out his ideas consistently. His statement that God is love seems aimed at that saying of Ecclesiastes that we cannot tell whether God bears us love or hatred. “Nay,” says John, “we can tell, and very simply! We know and have trusted the love which God hath in us. God is love.” (Peirce 1893b, EP 1, p. 353).

Peirce clearly prefers the conception of love from Christian writings and then takes up the Christian moral principle known as the golden rule. In the very next paragraphs, Peirce restates the golden rule of Christianity as the highest goal of evolutionary processes touching on the Golden Rule, self-interest, and love of self.³

Having made it clear that the kind of love he is elaborating is the sentiment that cherishes others, Peirce draws conclusions and makes connections with the previous essays in the series. He holds that love is the core idea of an evolutionary philosophy and it is required to understand how the human mind grows and develops, both individually and socially. Here, because it is one of the clearest passages Peirce has written, is his summation of the aims of evolution at its highest levels of purpose:

Everybody can see that the statement of St. John is the formula of an evolutionary philosophy, which teaches that growth comes only from love from – I will not say self-sacrifice, but from the ardent impulse to fulfill another’s highest impulse (Peirce 1893b, EP 1, p. 354).⁴

Peirce continues embellishing his conception as to how the mind grows and develops and is related to his mathematical idea that mind embodies the property of continuity or synechism as he called it:

The philosophy we draw from John’s gospel is that this is the way the mind develops; and as for the cosmos, only so far as it yet is mind, and so has life, is it capable of further evolution. Love, recognising germs of loveliness in the hateful, gradually warms it into life, and makes it lovely. That is the sort of evolution which every careful student of my essay, “The Law of Mind” must see that synechism calls for (Peirce 1893b, EP 1, p. 354).

After offering general evolutionary themes with regard to philosophy and Christianity often with excessive rhetorical embellishment, Peirce then takes what may be a surprising turn. He turns to the subjects of the economy and economics with the clear implication that these are not areas of human endeavor which rise to the highest purposes of creative love. Here he criticizes Newcomb's Principles of Political Economy, its conception of the self, and the role of greed in economic activity as displayed on Wall Street in the 1890s. There will be more on Newcomb subsequently.

In the remaining passages of "Evolutionary Love," Peirce presents his theory of three interrelated types of evolutionary processes and illustrations of each in human and natural history.⁵ The first theory considered in some detail is Darwin's. By 1893 when Peirce wrote this essay, it had been over thirty years since he had first read the Origin of Species. In Peirce's view, Darwinian evolution is about the struggle for existence. Chance plays a role. Chance precedes and begets order. Fortuitous variations occur which create a strength or advantage for some varieties of plants and animals so that natural selection occurs. Those species and individuals which acquire an advantage are the ones which dominate this competitive struggle for existence.⁶

The second theory of evolution is mechanism or a principle of mechanical necessity. In principle it radically differs from evolution by chance variation. If change and growth are thought to be predetermined by some force or principle of necessity and if this mechanical necessity is thought to be nearly unalterable, then we have a mechanistic view of evolution. At the time when Peirce was writing, he thought that many naturalists in embryology and genetics and many geologists embraced a principle of mechanical necessity in explaining apparent change in their domains of study. Also, in the domain of human history, Peirce thought that Hegel's theory and philosophy of history was deterministic and mechanistic.

The third theory of evolution was the Lamarckian theory. According to Peirce, there may be "hypertrophies or atrophies" which individuals transfer to their offspring.⁷ The variations among individuals arise neither by chance nor by a principle of mechanical necessity. Instead an individual in a species strains to accomplish a task or as Peirce remarked: "the straining of endeavor and the overgrowth superinduced by exercise" (Peirce 1893b, EP 1, p. 360). For Peirce, the action of an individual within a variety or species has an end, thus there was an implicit and inherent psychological aspect to Lamarckian evolution:

Now, endeavor, since it is directed toward an end, is essentially psychical, even though it be sometimes unconscious; and the growth due to exercise...follows a law of a character quite contrary to that of mechanics (Peirce 1893b, EP 1, p. 360).

It is in the context of Peirce's interpretation of Lamarckian evolution that human purposiveness appears. Action directed towards an end has purpose. The highest end or purpose in the universe is love according to Peirce. Peirce's view of evolutionary love, as he conceives it, is Lamarckian. Since there are several conceptions of love, somehow we need to select the highest form of love. Peirce briefly considers eros as a conception of love. However he believes that eros dominates the Darwinian level of evolution. He sees a logically superior form of love in the New Testament. Here Peirce as his introduction indicates, turned to St. John and his conception of the role of love in the creation and development of the universe. Peirce argued that St. John presents an evolutionary cosmology based on the logical principles of agape as presented in the life and teachings of Christ in the New Testament.⁸

3. Critique of Newcomb's Principles of Political Economy

Obviously the economic section of "Evolutionary Love" has been left to last. It should be abundantly clear that Peirce viewed economic activity and the discipline of economics within the context of his evolutionary, indeterministic cosmology as set forth in The Monist metaphysical series. Peirce wants to make room for mind and purpose not just in philosophy or philosophy of science, but also in the realm of economics. The economic part of "Evolutionary Love" comes near the beginning of that article. In between the introduction giving an evolutionary interpretation of philosophy and Christianity and later sections giving his three layered, mathematically interpreted theory of evolution is found Peirce's critique of Newcomb's Principles of Political Economy and Wall Street. As he begins the economic passage, Peirce maintains that the 19th century is rapidly coming to a close. He asserts that it will be known as "the Economical Century." The reason for this is that he seems to believe that economics is more related to the various types of human activities in that century than other disciplines.

The nineteenth century is now fast sinking into the grave, and we all begin to review its doings and to think what character it is destined to bear as compared with other centuries in the minds of future historians. It will be called, I guess, the Economical Century; for political economy has more direct relations with all the branches of its activity than has any other science (Peirce 1893b, EP 1, p. 354).

Following these initial remarks, Peirce shifts to the rhetorical theme of the gospel writer, redemption, offering a harsh criticism of the impact of economics in the life of the 19th century society:

Well, political economy has its formula of redemption, too. It is this: Intelligence in the service of greed ensures the justest prices, the fairest contracts, the most enlightened conduct of all the dealings between men, and leads to the summum bonum, food in plenty and perfect comfort. Food for whom? Why, for the greedy master of intelligence...What I say, then, is that the great attention paid to economical questions during our century has induced an exaggeration of the beneficial effects of greed and of the unfortunate results of sentiment, until there has resulted a philosophy which comes unwittingly to this, that greed is the great agent in the elevation of the human race and in the evolution of the universe (Peirce 1893b, EP 1, p. 354).

Having asserted the primacy of the role of economics in human affairs in the 19th century, Peirce next moves to criticize the discipline of economics. In the middle of the previous paragraph, he had interjected that he fully acknowledged “the scientific character” of political economy. There he also asserted that he recognized the idea of self interest and other basic principles of political economy. But he also maintained that generalizations made on the basis of those principles may not be true. What follows next is a critique of an economics text without directly identifying the work:

I open a handbook of political economy, – the most typical and middling one I have at hand, – and there find some remarks of which I will here make a brief analysis. I omit qualifications, sops thrown to Cerberus, phrases to placate Christian prejudice, trappings which serve to hide from author and reader alike the ugly nakedness of the greed-god. But I have surveyed my position (Peirce 1893b, EP 1, p. 355).

After these general comments, Peirce directly quotes the unnamed author:

The author enumerates “three motives to human action:

The love of self.

The love of a limited class having common interests and feelings with one’s self.

The love of mankind at large” (Peirce 1893b, EP 1, p. 355).

Simple comparison reveals that the preceding remarks are from Newcomb’s (1886) Political Economy.⁹ On the next page or so, Peirce offers criticism of the preceding comments and those

passages immediately following in Newcomb's Principles. His objection to the first form of love is that self-interest or greed is paraphrased in terms of love. Turning to the second conception, Peirce recognizes that it is a form of love but a very weak one at that. The third kind of love is interpreted as a sense of public spiritedness rather than some intense passion for the good of others. Peirce does recognize that Newcomb sees limits both to self-interest and to public spiritedness. However, Newcomb goes on to argue that concern with the welfare of mankind at large could mean that especially harsh measures should be taken to discourage or prevent the poor and criminals from having children. Peirce interprets Newcomb's comment to mean that higher forms of love cannot affect the conditions of the poor and the criminal. Newcomb goes on to further qualify his views again asserting that there are limitations to greed and self-interest. Newcomb even asserts that society could not exist on intelligent greed alone. But Peirce maintains that Newcomb's qualifications merely serve to obscure his main positions which will be truly recognized by an insightful reader.

The passages on economics in "Evolutionary Love" continue. After ending his direct remarks on Newcomb's Principles, Peirce next offers broad generalizations regarding the attitudes of economists in the 19th century. He believes that they not only have elevated the idea of greed, but that they also have tacitly criticized points of view emphasizing human sentiments. Here Peirce acknowledges that sentimentalism has been viewed as excessive since the French Revolution. But the criticism of the sentimentalists has been so severe that they are viewed as "persons incapable of logical thought and unwilling to look facts in the eyes."¹⁰ But Peirce objects to this criticism and identifies it with other forms of unthinking prejudice found in society at large. His criticism of economists such as Newcomb who practice such prejudice is sharp and direct:

The economists accuse those to whom the enunciation of their atrocious villainies communicates a thrill of horror of being sentimentalists....But what after all is sentimentalism? It is an ism, a doctrine, namely, the doctrine that great respect should be paid to the natural judgments of the sensible heart. This is what sentimentalism precisely is; and I entreat the reader to consider whether to contemn it is not of all blasphemies the most degrading (Peirce 1893b, EP 1, p. 356).

After making these comments, Peirce again seems to turn to the imagery of St. John of the New Testament especially the writer of the book of Revelation. He seems to imagine the possible collapse of the economy if greed and self-interest are not checked by the sentiments of the heart for the well-being of others. Perhaps he is off by half a century, but Peirce imagines an economy in

systemic crisis which evokes images of the Great Depression which would come sooner than he imagined:

Soon a flash and quick peal will shake economists quite out of their complacency, too late. The twentieth century, in its latter half, shall surely see the deluge-tempest burst upon the social order, – to clear upon a world as deep in ruin as that greed-philosophy has long plunged it into guilt. No post-thermidorian high jinks then! (Peirce 1893b, EP 1, p. 356).¹¹

From the extremes of capitalism, Peirce turns back to Darwin. Here Peirce asserts that there has been an evolutionary thread in political economy and that Darwin's theory of evolution was in part inspired by the economic theory of competition among large numbers of market participants. In one of the more important passages of "Evolutionary Love," Peirce restates his conception of the connection between political economy and Darwin:

The Origin of Species of Darwin merely extends politico-economical views of progress to the entire realm of animal and vegetable life. The vast majority of our contemporary naturalists hold the opinion that the true cause of those exquisite and marvelous adaptations of nature for which, when I was a boy, men used to extol the divine wisdom, is that creatures are so crowded together that those of them that happen to have the slightest advantage force those less pushing into situations unfavorable to multiplication or even kill them before they reach the age of reproduction (Peirce 1893b, EP 1, p. 357).

The passage continues with Peirce highlighting that market and Darwinian biological forces are mechanical in nature. This mechanistic interpretation of social and natural forces is incompatible with the highest teachings of Christianity in Peirce's view:

Among animals, the mere mechanical individualism is vastly reenforced as a power for making good by the animal's ruthless greed. As Darwin puts it on his title-page, it is the struggle for existence; and he should have added for his motto: Every individual for himself, and the Devil take the hindmost! Jesus, in his Sermon on the Mount, expressed a different opinion (Peirce 1893b, EP 1, p. 357).

Having stated it once, Peirce restates his view that Christianity is diametrically opposed to economics and Darwinian social principles. Peirce imagines a choice between a gospel of love and a gospel of greed:

Here, then, is the issue. The gospel of Christ says that progress comes from every individual merging his individuality in sympathy with his neighbors. On the other side, the conviction of the nineteenth century is that progress takes place by virtue of every individual's striving for himself with all his might and trampling his neighbor under foot whenever he gets a chance to do so. This may accurately be called the Gospel of Greed.

Much is to be said on both sides. I have not concealed, I could not conceal, my own passionate predilection. Such a confession will probably shock my scientific brethren. Yet the strong feeling is in itself, I think an argument of some weight in favor of the agapastic theory of evolution, – so far as it may be presumed to bespeak the normal judgment of the Sensible Heart. Certainly, if it were possible to believe in agapasm without believing it warmly, that fact would be an argument against the truth of the doctrine (Peirce 1893b, EP 1, p. 357).

These are the last of his comments on political economy and the economy in “Evolutionary Love.” Peirce next outlined his three-part conception of evolutionary processes – chance, mechanism, and higher purpose, or with Peirce's names – tychasm, anacasm, and agapasm. Then he next turned to illustrations from the history of human culture and science.¹²

4. Newcomb's Critique of American Political Economy, Science, and Religion

From the perspective of the early 21st century, several things about “Evolutionary Love” are quite puzzling. One conundrum is why Peirce would have chosen Newcomb and political economy for such significant criticism. It is clear that Peirce sees the emerging discipline of economics and its broader influence on society as being dominated by lower rather than higher purposes, by an eros of self interest rather than agape. His answer seems to be twofold: that society was increasingly being dominated by economic activity and that political economy was the discipline most directed at understanding this dominant social activity within science and academia. But there is more to this conundrum. The second puzzling aspect of “Evolutionary Love” is why religious and evolutionary themes have such prominence. An answer would be that post-Civil War America was

debating the interrelationship of Christianity and evolution. Furthermore, the debate between Christianity and evolution had also emerged within the economics profession in the mid 1880s. Perhaps the best answer to the puzzling aspects of “Evolutionary Love” is that the religious, scientific, and economic controversies of late 19th century America came to be embodied in one particular figure with great proximity to Peirce, Simon Newcomb.

In the late 19th century, Newcomb was one of America’s best known and probably one of its most powerful scientists. He had spent most of his career as a professor at the naval observatory in Washington, D. C. He had served as President of the American Academy of Arts and Science and as President of the Political Economy Club in the 1880s. He eventually received numerous awards for his most important astronomical research more accurately measuring the movements of the moon and the planets in our solar system. In the 1880s, Newcomb joined the faculty of Johns Hopkins University and his views regarding the competence of junior faculty were often communicated to President Daniel Gilman. This was especially the case for Peirce and Ely. Newcomb also confronted America’s most prominent theologians on the relationship between theology and science and of course evolution and Christianity. For the nation’s centennial, Newcomb also had offered his harsh appraisals of American science and political economy maintaining that they were way behind European science and British political economy. Newcomb also thwarted Peirce’s career progress on numerous occasions playing a pivotal role in his exclusion from academia after 1885.

Newcomb’s interest in economics began very early in his life. While he was in Cambridge working as a computer with the Nautical Almanac, Newcomb had the occasion to meet Henry Carey. Carey was considered America’s most highly regarded economist. The president of Harvard Thomas Hill had asked him to attend a meeting with Carey in 1863 or 1863¹³. Newcomb came away impressed with Carey’s views enough so that he read some of Carey’s economic works. However, Newcomb’s reading of Carey’s “Principles of Social Science” left him with the impression that Carey’s political economy was not very scientific.¹⁴ In his centennial article in the North American Review, “Abstract Science in America,” Newcomb provides an exceptionally critical appraisal of Carey’s work:

Our only writer who has ever created even a ripple on the surface of economical thought is Mr. Carey, and his methods and results are so different from those by which the science has been developed, that it is difficult to give him a place among economists. Such a place can be fairly assigned to him only by confining ourselves to the subject-matter of his researches, and ignoring his methods as unimportant....We mention him because our choice lies between taking him as the

great representative of American political economy, or admitting that we have no system of political economy to call our own (Newcomb 1876, p. 116).

With the preceding comment it is clear that Newcomb views America as far behind the times in making contributions to political economy. This is a point Newcomb also makes for the abstract sciences which includes the natural sciences and mathematics. Perhaps it is even more extreme in claiming we have no contributions to political economy that could be called our own. Newcomb's article was part of a symposium of six articles appraising various aspects of intellectual progress in America since the Declaration of Independence in 1776. The title of all of the articles including Newcomb's are:

“Religion in America, 1776-1876,” by J. L. Dilman,
 “Politics in America, 1776-1876,” by W. G. Sumner,
 “Abstract Science in America, 1776 to 1876,” by Simon Newcomb
 “Economic Science in America, 1776-1876,” by Charles F. Dunbar,
 “Law in America, 1776-1876,” by G. T. Bispham, and
 “Education in America, 1776-1876,” by D. C. Gilman.

There are several things that are interesting about the list of articles and authors. One is that three of them were considered to be or extensively associated extensively with economists – Newcomb, Dunbar, and Sumner. Another is that religion, education, and law are so prominent in the list of topics. A third aspect of interest is that the review of education was written by Gilman who would take the presidency of Johns Hopkins and launch the nation's first prominent graduate school where so many academic disciplines, professional organizations, and academic research journals would get their start. Gilman also offered classes in political economy when he was president of the University of California at Berkeley.

At another point in his 1876 article Newcomb revealed his preferred approach to political economy. Newcomb believed that the most progress in political economy had come in England:

Political economy, as hitherto developed, is just that branch of applied thought, if we may use the expression, which most requires sagacity for its apprehension and application; and this quality is seen pre-eminently in the large comparative ratio of sense to nonsense in the mass of English writing on the subject (Newcomb 1876, p. 90).

Near the end of his centennial article, Newcomb considers changes that are needed to make American science better. One important suggestion is that American science needs to develop its own specialized science journals. Another is that America needs to develop the scientific and educational institutions to create its own class of leaders in science that would rival those in Europe. A third suggestion is that Newcomb believes that the political leaders of the country need to understand the logic of scientific principles. Changes in society and government need to be logically thought out. Newcomb imagines science and the logic of science as part of the liberal educational process in the country and he believes leaders in all sectors of our society should be familiar with John Stuart Mill's ideas on logic:

What is required to insure us against disaster is not more technical research, but the instruction of our intelligent and influential public in such a discipline as Mill's logic, to be illustrated by the methods and results of scientific research. The present great movement in favor of scientific education will be productive of one excellent result, if it serves to direct the minds of the rising generation towards the methods of science, and the ways in which those methods must be applied to the study of societal laws rather than to the technicalities of science, or to its practical applications to the ordinary operations of industry (Newcomb 1876, pp. 122-123).

After taking on the scientific community in 1876, just a few years later Newcomb engaged some of the nation's most prominent theologians over evolution and Christianity. The title of the entire symposium and each individual contribution was "Law and Design." Like the centennial essays, this group of essays appeared in The North American Review in May of 1879 with Newcomb's reply a month later:¹⁵

"Law and Design in Nature," Simon Newcomb
 "Law and Design in Nature," Rev. Noah Porter
 "Law and Design in Nature," Rev. Joseph Cook
 "Law and Design in Nature," Rev. James Freeman Clarke
 "Law and Design in Nature," Rev. James McCosh
 "Evolution and Theology: A Rejoinder," Simon Newcomb

In his contribution, the lead off essay of the symposium, Newcomb imagines a conflict between a "scientific school" and a "religious school." Newcomb first presents what he believes are the key

aspects of a scientific view of the world and how it might communicate with the religious school:

The first step toward clearing the ground for mutual understanding is, to state and explain the position taken by the scientific school, and to inquire of the other whether this position is entirely untenable. The fundamental postulate of the scientific philosophy is a principle founded on a limited series of observations, and extended by induction to the whole course of Nature. It may be expressed in the following words:

The whole course of Nature, considered as a succession of phenomena, is conditioned solely by antecedent causes, in the action of which no regard to consequences is either traceable by human investigation, or necessary to foresee the phenomena (Newcomb 1879a, p. 538).

In the comments which follow, Newcomb is concerned to argue that his view is sound doctrine from a scientific perspective. Whether it is sound from a religious perspective is a concern he will leave to the theologians. With his framing of the question, Newcomb admits that he is attempting to pose the issue in such a way as to evoke a response from those who adhere to a religious view of nature. He is not raising the question of whether the hypothesis of a “Supreme Will” or that of a “Creator” is consistent with his view that natural phenomena are conditioned only by antecedent causes. His aim is to eliminate from the discussion abstract conceptions such as necessity and potentiality that are not essential for doing scientific research. Newcomb also asserts that his thesis regarding nature as a succession of natural phenomena does not rule out explanations that do not conflict with science. Notice how similar this idea seems to William James’s idea of the “will to believe:”

Respecting this everyone is at liberty to hold any opinions without coming into conflict with the scientific philosophy, provided only that he draws no conclusion inconsistent with what the other believes to be a legitimate induction from observation. For instance, it is not objectionable to the postulate to say that all things are determined by a Divine Will, because the postulate assumes nothing respecting such will, and has nothing whatever to do with its supposed immanence in Nature, unless inconsistent with observed facts are founded upon it. So long as the religious school admits that stones fall, water runs, and storms move, according to the scientific postulate, they may place any occult causes behind those phenomena which do not lead to results incompatible with it. For the same reason there is no objection

to maintaining that things were designed to be as they are, unless such design is considered to be a physical cause which can be traced by studying such things (Newcomb 1879a, p. 540).

Newcomb's questions and assertions regarding science and religion drew responses from four different members of the clergy including Noah Porter at Yale and James McCosh at Princeton. Porter was the first to respond to Newcomb. Porter maintained that Newcomb has not drawn the distinctions between the scientific and theological schools adequately. Using the terminology of causality, Porter held that the analysis of the reasons for the burning theater, which was Newcomb's example, could be caused by both physical-efficient and final causes. He ascribes to Newcomb the view that: "In the example cited of the burning of a theatre, the scientific school recognizes only physical agencies or causes."¹⁶ In the main body of his reply, Porter maintains that both physical and final causes are apparent in the course of nature. At one point, he asserts that Newcomb's positions are quite like those of the positivists. Porter also asserts that the narrow scientific position requires concepts suggesting design in nature such as the idea of law and induction. Porter thus denies the dichotomy Newcomb seems to assert between those who believe in scientific laws and those who believe the patterns and complexities of nature show prospects of design.

The last responder was McCosh. Like Porter, McCosh maintains that the idea of scientific law is not in conflict with the theological conception of design. He asserts that the scientist argues that every physical event has a cause even when chance is involved. In a similar way, the religious person believes that every event has "a cause and a purpose, too."¹⁷ At the end of his response, McCosh launches into a critique of the mind set of certain scientists as being narrow minded and perhaps deranged. While he does not mention Newcomb by name initially, the fact that McCosh's response is in direct reply to Newcomb means that the force of those comments are directed against Newcomb:

I may remark here that there seems, among some of our scientists in the present day, to be a derangement of mental vision produced by their gazing exclusively on some object. God has given to every man two eyes; and there are benefits derived from binocular vision – it enables us, as the Irishman said, to look round a corner, and see more than one side of an object (McCosh 1879, p. 562).

In the next few sentences, McCosh makes it clear that he is directing his comments at Newcomb:

But by looking so long through a microscope some seem to have become one-eyed. There is no good end to be gained by setting the two schools to which the Professor refers, the scientific and the theological, against each other. The business of the physicist may be simply to trace the properties of mechanical force, and of the physiologist to discover the faculties of the mind. The business of the theologian is to discover the operations of God. He is a narrow man who in inquiring into Nature can discover only mechanical force – while he overlooks vital and psychical agencies (McCosh 1879, p. 562, italics in original).

McCosh goes on to characterize both exclusively religious or scientific perspectives as being too narrow. He maintains that a truly enlightened person would be interested in both perspectives and see no inconsistency between them.

5. Newcomb's Interests in Economics

It was at Harvard that Newcomb encountered Benjamin and Charles Peirce, their interests in mathematics, science, and philosophy – and it needs to be emphasized – economics. Like Peirce, Simon Newcomb was educated in mathematics and astronomy at Harvard. After astronomy and mathematics, economics was Newcomb's greatest intellectual pursuit. His interest in economics apparently began after reading John Baptiste Say's Principles of Political Economy. In his autobiographical memoir, Newcomb describes the origins of his interest in economics:

A certain interest in political economy dates with me from the age of nineteen, when I read Say's work on the subject, which was at the time in very wide circulation. The question of protection and free trade was then, as always, an attractive one. I inclined toward the free trade view, but still felt that there might be another side to the question which I found myself unable fully to grasp (Newcomb 1903, p. 400).

Newcomb goes on to tell us that he imagined that Adam Smith's Wealth of Nations could be supplemented with other works on the strengths of nations focusing on additional sources of national power other than wealth.

When Newcomb began writing about economic subjects he was already a professor of mathematics in the U. S. Navy. Newcomb had taken his undergraduate degree in mathematics from Harvard in 1858 studying with Benjamin Peirce. He continued his education at Harvard until 1861 when he received an offer to join the Naval Observatory in Washington, D. C. During the Civil

War, Newcomb became one of the most prominent critics of the financing of the war and the issuing of federal paper currency known as “greenbacks.” Newcomb thought that the note issues were irresponsible. In 1865, his first book on economics was published and titled, A Critical Examination of Our Financial Policy During the Southern Rebellion.¹⁸

One avenue that Newcomb pursued for further developing his ideas on economics was reviewing prominent economics textbooks. Over a period of ten years, he wrote three book reviews that appeared in the North American Review. He began in 1866 with a critique of the political economist who President Hill had lavishly praised some years earlier. He reviewed Henry Carey’s Principles of Social Science quite unfavorably. A few years later Newcomb reviewed another economics treatise that would become much better known than Carey’s Principles. In 1872 he published a review of W. S. Jevons’s Theory of Political Economy which first appeared in 1871. Here we should recall that Charles Peirce met Jevons on his first European trip in 1870 and was sufficiently impressed with Jevons’s subsequently published Theory to use it as the basis for his mathematical model of the economy of research. We have no way of knowing whether it was the Peirce or Newcomb who first knew of Jevons’s book. In his review of Jevons’s Theory, Newcomb begins by noting two different standards for judging the book. One standard is how advanced the ideas are within the discipline and the other is how accessible the ideas are to the educated public. Newcomb believes that Jevons’s book has difficulties with both standards. The book is far too mathematical to be understood by the public and there is another book in mathematical economics which Newcomb regards as superior. He claims that Cournot’s book published decades earlier was a much better mathematical treatment of economics:

If we compare Professor Jevons’s work with Cournot on the same subject, published more than thirty years ago, we cannot but admit that in fertility of method and elegance of treatment it falls far below it. But the latter can be understood only by an expert mathematician, and the number of those who are at the same time mathematicians and economists is too small even to perpetuate the knowledge of such a work (Newcomb 1872, pp. 435-436).

A third review of an economics treatise by Newcomb appeared in the North American Review in 1875. On the surface, the article is broached as a review of J. E. Cairnes’s treatise on political economy which was published in London in that same year.¹⁹ However, the title of Newcomb’s review, “The Method and Province of Political Economy,” conveys intellectual judgments and aims much more ambitious than those of a book review. Much of the article is an

over view of Newcomb's conception of the methods of science that might be fruitful in political economy. The review begins by noting that every writer on economics claims that his work is scientific. Newcomb offers us his appraisal that most of the attempts to create a scientific approach to political economy have failed. The failures often emerge from a fundamental confusion. Most writers on political economy have taken actual historical episodes in the economy as contradicting the basic principles of economics as identified by Smith, Ricardo, and Mill. Newcomb maintains that a sharp separation needs to be made between the general principles of the science and the actual events of economic activity. He illustrates with an example from mechanics. The law of falling bodies holds only in a vacuum and does not hold exactly under everyday conditions due to the resistance of air pressure. The presence of air pressure does not refute the law of falling bodies. Milton Friedman would use this same example in his essay on method seventy six years later.

This brings Newcomb to the crucial difference with Cairnes. Newcomb maintains that the theory of economics can be formulated mathematically. He maintains that while the patterns of economic activity are motivated by mental conceptions emanating from human will and while mental conceptions are difficult to quantify, the actions of the everyday economy are mostly embedded in numerical magnitudes. The profit-maximizing producer needs to keep the financial records of the company as exactly and accurately as possible. Workers are concerned with the numerical value of their wages especially for different types of jobs. Newcomb clarifies what he believes the benefits of mathematical methods in economics would be:

Mathematical analysis is simply the application to logical deduction of a language more unambiguous, more precise, and for this particular purpose, more powerful than ordinary language. That a vague and indefinite language can for any purpose of thought be better than a precise one, no one will maintain, and the dispute must turn upon the question, whether it is possible to express the propositions of political economy in mathematical language (Newcomb 1875, p. 266).²⁰

Progress in political economy will happen when economists approach the problems of the economy in the same manner as those in the physical sciences. Referring to progress in the physical science, Newcomb again repeats his vision of mathematically developed scientific economic advice to government:

...it is not unreasonable to expect that no important advance will be made in political economy till it is studied in the same way [as physical science]. Unfortunately, there

are obstacles in the way of development and application of its principles in the manner in which those of physical science are developed and appliedWhen an academy of scientific experts shall be called on by Congress to investigate the effect of a proposed tariff upon the industry of the country, an extraordinary advance will have been made in our intellectual status (Newcomb 1875, p. 267).

Clearly Newcomb's idea of an academy of scientific experts in political economy would be taken up later by Peirce in a companion series of articles to those in The Monist where "Evolutionary Love" had appeared. Those would be the essays of The Open Court series.

Besides expressing his views on political economy in book reviews, Newcomb also wrote several significant articles outlining his views on political economy. Again, many of these articles appeared in the North American Review in roughly the same period as the book reviews just considered previously. The first and longest piece concerns the rights of an individual and the extent that government policies should not interfere with individual rights. It is titled "The Let-alone Principle" and it was published in 1870. The second article concerns the type of monetary system the country should have. It is titled "The Standard of Value" and appeared in 1879. The third piece is concerned with taxation and the tax system of the nation. Its title is "The Principles of Taxation" and it appeared in 1880. Also in 1880 a two-part article titled, "The Organization of Labor" appeared in The Princeton Review. The first part highlighted the role of managers and the emergence of large-scale industrial organizations and the second part considered the role and plight of the worker and was very anti-union.

Newcomb's writings on the economic problems of the nation and his interests in economic theory did not go unnoticed. He was invited by President Elliot of Harvard to give three or four lectures on political economy in Cambridge during the fall of 1879. He chose the topic of taxation. At Johns Hopkins after 1884 Newcomb participated in the doctoral exams of graduate students in political economy and taught an undergraduate course in political economy during the 1887-1888 academic year.²¹ Additionally in 1884 a club was formed to discuss prominent economic issues of the day, the Political Economy Club of America. Newcomb was elected as its president and continued in that capacity for several years. The club included economists and others interested in advancing the state of economics in the country. Mostly its members were from the northeast. However, the event which sparked a storm of controversy was the publication of Newcomb's Principles of Political Economy in the mid 1880s. Newcomb's text embodied his vision of a scientific approach to economics and drew significant criticism from several opponents in Science. This episode is now well-known in many respects in the history of economics. Newcomb's

opponents went on to found the American Economic Association which he eventually joined.²² Economists with Newcomb's more conservative economic outlook eventually were incorporated within the AEA as the views of its founders moderated and became more inclusive.

In 1875, Newcomb had imagined the day when economics would become so advanced scientifically that it might found an academy of scientific advisors and advise the government about the empirical consequences of issues like the tariff. In his Principles, Newcomb took a step towards achieving his conception of a scientifically informed discipline of economics that might some day provide scientifically based quantitative analysis to government. Newcomb's Principles is mostly non-mathematical and contains no calculus or more advanced mathematics which Newcomb was surely capable of providing. There are a few equations in the book mostly regarding the quantity theory of money which provides the basis for understanding inflation. However, Newcomb's vision of an economics discipline based on the most recent scientific methods is apparent right from the beginning.

Newcomb's Principles of Political Economy was written in five major sections called books. The headings of these major sections are as follows:

Book I. Logical Basis and Method of Economic Science

Book II. Description of the Social Organism

Book III. The Laws of Supply and Demand

Book IV. The Societary Circulation

Book V. Applications of Economic Science.

In many respects Book I follows Mill's broad conceptions about how to build a science as a systematic body of interrelated concepts and results in a subject of inquiry.²³ Mill advocated paying great attention to concepts and definitions. Newcomb begins with an imaginative presentation of the economy as an interrelated system of economic activities. He imagines how patterns of human activities have changed over the past 400 years. Cities, railroads, farms, and factories had appeared. Human beings engaged in these activities appear to be participating in a harmonious system of activities. While no one provides overall direction to this system of activities, Newcomb claims that there are internal forces which govern those observed patterns of activity. He calls this mechanism the "social organism." The motivating force behind this mechanism is the aspiration of each individual to fulfill their own desires in obtaining the things which are valued most. While it is useful to analyze the social organism, Newcomb does claim that it does not have individuality like that ascribed to particular human beings. He imagines studying this organism like a physician

studying the human body. However, there are important differences requiring different scientific methods than those used in medicine. The study of the economy is much more indirect and poses special problems. For this reason, Newcomb takes the next four chapters to develop the methods for a scientific approach to economics. Chapter 2, develops core concepts and definitions of political economy. Noting that the name of the discipline is changing, he tells us that economics is the term that has been introduced by recent English writers on economics.²⁴ He also provides a definition nearly identical to the famous conception provided by Lionel Robbins in the mid 1930s. In the mid 1880s, Newcomb defines economics in the following way:

Economical science, therefore, considers man simply as an adapter of means to ends, but does not inquire how these ends arise, nor whether they are really the ends toward which men should strive. If this limitation seems unsatisfying to the reader, he must remember that the mixing up of different branches of inquiry is productive of confusion of thought, and that the questions whether an end is good and how an end can best be attained are totally different (Newcomb 1886a, p. 13).

In chapter 3, Newcomb presents a broad view of scientific method clarifying conceptions of general principles, induction, deduction, cause and effect, abstraction, and pure and applied science. He also asserts that the scientific method closely approximates the methods of inquiry used in common sense methods of reasoning about business and household matters. Chapter 4 focuses on what Newcomb regards as unique aspects of the methods of economics. There are more limitations on data and more reliance on deduction than for other sciences. But economics will make progress and become scientific to the extent it learns to predict the consequences of changes in economic circumstances on subsequent economic events. Chapter 5 considers methodological errors commonly made with regard to economic questions. There is a “doctrinaire’s error” of making generalizations that are too broad to be defended, there is a “popular error” of relying to excessively on deduction, and also the tendency to confuse what is with what should be.

Book II, “Description of the Social Organism,” discusses many of the aspects of the overall functioning of a market economy. Newcomb defines conceptions of wealth, property, production, capital, and labor and theories of population, business fluctuations, and prosperity. The last few chapters of this book deal with money, banking, and the financial system. Book III takes up the theory of supply and demand, monopoly, rent, competition, market equilibrium, and taxation among other topics. Book IV develops Newcomb’s version of the quantity theory of money and many of its implications. Book V considers applications of the economic theory Newcomb had developed

in the previous books. The first chapter of this book is a shorter version of “The Let Alone Principle.” Here the principle is presented in a more muted and less polemical manner. Other chapters present overviews on economic policy issues on which Newcomb had previously written – topics such as tariffs, taxation, mono versus bimetallism, and regulating the currency. There is also a chapter on socialism and another on charity. Socialism obviously clashes with the let alone principle even though it aims may be high minded. Charity is a product of a more developed economy and its existence may encourage greater numbers of those in need. Newcomb’s view is contrary to the most popularly accepted views of poverty.

6. Newcomb and the New School Economists

Newcomb’s comments on the lackluster state of science and political economy in America did not go unnoticed. One response was to call for enhancements to American higher education so that the brightest American students would not have to go to Europe to get their doctorates. Johns Hopkins University was created in 1876 to be a leading center of graduate education in the United States. A few doctorates had been given in the United States, but few colleges had developed to the level where they could offer systematic programs of doctoral level graduate study. Another response was to create journals and professional associations in North America. Newcomb would become a central figure in both of these responses. Newcomb’s articles on the state of science in America not only drew wide spread acclaim, they drew the attention of President Gilman at Johns Hopkins. In addition to his professorship at the Naval Observatory, Newcomb was offered a professorship at Johns Hopkins in mathematics and astronomy in 1884 on a half time basis.²⁵ Not to be forgotten is that his publications in economics and his prominence in American science also led to his being elected as President of the Political Economy Club in 1884.

While Newcomb’s main appointment at Johns Hopkins was in mathematics and astronomy, his prominence in economics led him to take an interest in that subject as well. At Johns Hopkins the only faculty member devoted full time to political economy was Richard T. Ely. Like others of a younger generation, Ely had gone to Germany to get his doctorate and studied with members of a new approach known as the German Historical School. Ely had studied with Karl Knies at Heidelberg.²⁶ Knies was known for advocating an enhanced role for the state in improving the lives of its citizens. In March of 1884, Ely wrote a long article that appeared in a Johns Hopkins University publication arguing for a new school of political economy and an enhanced role of the state in the American economy. Newcomb became so concerned that he wrote President Gilman asking for an “opportunity to say a few words about your department of political economy....”²⁷

Writing about a decade after Newcomb had offered his appraisals of American science and

political economy, Ely also article provided a highly critical appraisal of the state of political economy in America since the nation had been founded in 1776. In “The Past and Present of Political Economy,” Ely argued that the economics taught and practiced in American institutions was no longer valid either scientifically or as a guide for the economic policies of government. Ely characterized the English theories of political economy which had dominated American economics for so long as an “Old School.” Instead there was a “New School” with better scientific methods and a different attitude toward the state which would supercede the Old School. The methods of the Old School were characterized as deductive and nearly immune to correction based on evidence. It was viewed as having adopted a conception of human nature and markets that led to immutable theoretical principles of economics like those of Newtonian physics. From those principles, implications were deduced which were often viewed as being valid if there was no flaw in the inference being made. The methods of the New School were characterized as being inductive. Economists were to observe the historical patterns of economic development and create concepts and theories informed by the process of observation. These methods of observations were offered as being more scientifically advanced than the methods of the Old School. Of particular importance was the role of the state. Ely argued for a positive role of the state in the economy and society. Summarizing views he had encountered in Germany, Ely asserts:

The one discovery is the law of increasing functions of government...the social, which acts through the state, and which socialists, reasoning on the false assumption that if a little is good, more must be better, wish to elevate to the reigning and exclusive principle of economic life. The state corrects, modifies, and rounds out individual action (Ely 1884, p. 55).

While Ely would argue that he was not a socialist, he did argue for a much expanded role of the state in late 19th century America. One reason for arguing for a larger role for the state was his interpretation of Christianity. Ely and others of the New School thought that Christian social principles known as the social gospel implied that the state ought to counterbalance the power of larger corporations and make life better for workers through regulation and other social policies. At one point Ely contrasts the Old School’s emphasis on self interest. Seemingly reaching out to the old school at one point he argues that self-interest can be elevated:

Now self-love is not an evil. It is a good and its exercise is commanded. He who is recognized as first among moral teachers, placed it on a par with love for one’s

neighbor. The two loves are not contradictory; they find their union in the highest love – love to God....Altruism must and does accompany self-interest and with the progress of the individual and national morality, they become ever more closely allied (Ely 1884, p. 37).

In the last paragraph of his article, Ely argues that the New School embodies the principle of the Golden Rule:

Again: this younger political economy no longer permits the science to be used as a tool in the hands of the greedy and the avaricious for keeping down and oppressing the laboring classes. It does not acknowledge laissez-faire as an excuse for doing nothing while people starve, nor allow the all-sufficiency of competition as a plea for grinding the poor. It denotes a return to the grand principle of common sense and Christian precept. Love, generosity, nobility of character, self-sacrifice, and all that is the best and truest in our nature have their place in economic life (Ely 1884, p. 66).

In his very last comment, Ely quotes another economist Thomas Hughes who asserted that the “first duty of man in trade....is to follow the Golden Rule – ‘Do unto others as ye would that others would do unto you.’ ”²⁸

Within six months, Newcomb’s concerns expressed privately to President Gilman about Ely appeared in publication. In November of 1884, Newcomb’s “The Two Schools of Political Economy,” appeared in the Princeton Review. Newcomb disputed Ely’s notion that the New School offered a revolutionary method of scientific inquiry. Indeed, Newcomb made the opposite point that the members of the New School really do not understand the methods of science very well. Newcomb maintains that the most important claim of the New School is their misguided objection to the abstract character of English political economy. Newcomb gives several examples of mathematics and science and then holds that every scientific discipline has a similar degree of abstraction:

We have made it quite clear, we trust, that the indictment under consideration lies with as much force against all the exact sciences as it does against Political Economy....The question which now meets us is whether it is possible to construct a system of Political Economy which shall be free from such objections. Our object is to answer this question in the negative, by showing that the imperfections alluded

to are inseparable from all exact knowledge (Newcomb 1884, pp. 72-73).

With regard to religious or moral sentiments regarding the subject matter of economics, Newcomb argued that both selfish and altruistic motivations for economic activity were within the purview of economics:

Economically and scientifically there is no difference between the acts of the man working to get a loaf of bread for himself, and of the man working to get a loaf of bread for his neighbor, except that the former are more common (Newcomb 1884, p. 78).

In his conclusions, Newcomb maintains that the New School cannot build a new theory of the economy without engaging in the type of theory they so criticized. He further asserts that the contributions of the New School are really erected on top of the theoretical system of English Political economy. He recognizes that the New School is making contributions to the superstructure of economics but little to its foundations. In the end Newcomb accuses the members of this new approach to economics of proceeding in an irrational way based on their numbers rather than on the substantive merits of their point of view.

In less than a year, the debate over the nature and future of American political economy would move to the pages of Science. Professional academic journals were just beginning to be established. Within a decade several prominent economics journals would be founded. However, in the mean time within the period of a year or two many articles appeared contesting the nature of political economy in America in more general publications. The articles that appeared within a nine month span in Science in 1885 and 1886 were:

Edmund James, "Newcomb's Political Economy," November 1885.

Simon Newcomb, "Newcomb's 'Political Economy'," Reply to E. J. James,"
December 1885.

Fabian Franklin, "Newcomb's Political Economy," Reply to E. J. James,"
December, 1885 (twice).

Edmund James, "Newcomb's 'Political Economy'," Reply to Newcomb and Franklin,"
December, 1885.

Seligman, Edwin R. A. "Changes in the Tenets of Political Economy with Time," April 1886

Edmund James, "The State as an Economic Factor," May 1886 (twice).

Frank Taussig, “The State as an Economic Factor,” May 1886.

Richard Ely, “Ethics and Economics,” June 1886.

Simon Newcomb, “Aspects of the Economic Discussion,” June 1886.

Richard Ely, “The Economic Discussion in Science,” July 1886.

Simon Newcomb, “Can Economists Agree Upon the Basis of Their Teachings?,”
July 1886.

Edmund James’s piece was a scathing critique of Newcomb’s Principles of Political Economy. Newcomb’s book appeared sufficiently early in time to be reviewed in late 1885. In his review, James had nothing good to say about Newcomb’s treatise. He begins by maintaining that Newcomb had no business presenting himself as an authority on economics.²⁹

Certainly it is, at any rate, that if a man who had given the best years of his life to the study of political economy should wander over into the field of astronomy and physics....Professor Newcomb would be just the man to administer a severe and deserved castigation. The offence is none the less serious, because in this case we have a great and successful astronomer and physicist wandering over into the economic field and undertaking to set things right (E. James 1885, p. 470).

James continued with the theme that Newcomb was out of his element in making comments about political economy. James asserts that science in general has developed to such an extent that one can no longer be an authority in two or three scientific disciplines. This means that Newcomb is no longer up to date. In James’s view, Newcomb presents the subject “as it was some time in the past” (p. 470). At this point, James gives his own version of some of the themes Ely had taken in his Johns Hopkins essay a year earlier. James claims that the scientific methods of Newcomb’s Principles are outdated in part because they show nothing of the new methods of the New School. He claims even more specifically that the theories Newcomb adopts are nearly universally rejected. Then comes an even more extreme dismissal: “A work prepared in this spirit would doubtless have a value in an old-fashioned college, but it would hardly be accepted by prevailing authorities as in any sense a productive contribution to the science” (James 1885, p. 470). From this general rejection, James takes up other more specific points. He criticizes Newcomb’s work for taking up “the old stand-point of extreme individualism,” for not being concerned with the extreme adverse consequences of a market economy based on laissez faire, and for not recognizing John Stuart Mill’s recognition of the worst aspects of capitalism. James also asserts that Newcomb tends to blur

socialists with those who are concerned with the plight of labor.

Whether one agrees with Newcomb's views of political economy, given the nature of his mind and intellect one would not expect him to be silent in the face of such severe criticism. In his rebuttal of December 4th 1885, Newcomb maintains that James viewed him as a trespasser in the field of economics. Even more significantly, he believes James had flagrantly misrepresented his views. This is made worse due to a type-setting error which makes some of James's comments appear as quotations from Newcomb's Principles. Without prior knowledge of the error, Newcomb accuses James of outright "fabrication" in misrepresenting his views on political economy. More significantly, he accuses James of misrepresenting his views of individualism in the market place. Newcomb also asserts that James portrayal of his view of the role of general abstract principles of political economy as holding for the past, present, and future is atrocious. Newcomb does admit that a reader of his book might confuse socialists with those who support labor. He attributes this ambiguity to space limitations in writing his book. At this point, there were several exchanges with Fabian Franklin commenting twice somewhat defending Newcomb and a long piece by Frank Taussig on the evolution of economic ideas since the ancient Greek.³⁰ There was also a debate between Edmund James and Frank Taussig over the role of government in the economy.³¹

By June of 1886, Richard Ely again offered his views of important aspects of political economy in his piece titled, "Ethics and Economics." Ely begins by discussing the role of definitions in economics. His point is that economic terms are often understood very differently by many economic thinkers. Terms such as capital, value, money, and utility are often misunderstood. Next he considers normative concerns maintaining that economists in their writings have discussed what ought to be much more than what is. At one point he offers the opinion that an ethical ideal animates the views of the New School economists.³² He goes on to relate the New School's conception of full human development with the doctrines of Christianity:

This means any thing rather than equality. It means the richest diversity for differentiation accompanies development. It is simply the Christian doctrine of talents committed to men, all to be improved, whether the individual gift be one talent, two, five, or ten talents. The categorical imperative of duty enforces upon each rational being perfection 'after his kind.' Now, the economic life is the basis of this growth of all higher faculties, – faculties of love, of knowledge, of aesthetic perception, and the like, as exhibited in religion, art, language, literature, science, and political life. What the political economist desires, then, is such a production and such a distribution of economic goods as must in the highest practicable degree

subserve the end and purpose of human existence for all members of society (Ely 1886a, p. 531).

Ely continues in the next few paragraphs arguing for a conception of political economy with higher moral aims. At one point he asserts that the state is more important than the individual. Referring to the New School as the ethical school Ely remarks: “But the ethical school, I think it safe to say, places society above the individual, because the whole is more than any of its parts.”³³ At another point he seems to be arguing for a Christian utilitarianism when he restates his view that “The end and purpose of economic life are held to be the greatest good of the greatest number, or of society as a whole.”³⁴

At the very end of Ely’s article a note was attached stating that Professor Newcomb would soon reply in a subsequent issue of Science. Newcomb’s piece is titled “Aspects of the Economic Discussion.” At the beginning of his comments Newcomb acknowledges that he is discussing the economic ideas of the so-called new school of economists.³⁵ Most of Newcomb’s reply is directed at his Johns Hopkins colleague Richard Ely. As one might expect, Newcomb is particularly perplexed with Ely’s view that the state should be more important than the individual. This obviously conflicts with the view Newcomb expressed in his “Let Alone” article and the chapter by the same name in his Principles. At one point, Newcomb seems to relate Ely’s views to socialism: “It seems to me these remarks of Professor Ely savor much more strongly of the doctrines of individualism, which he vigorously opposes, than of those of the socialistic school of which he is so distinguished an expounder”³⁶ Just a few paragraphs further, Newcomb quotes the passage from Ely regarding the Christian parable of the individuals having different talents. Here Newcomb contends that this Christian parable can be interpreted in an entirely different way claiming the converse of Ely that the parable “gives an admirable statement of the doctrine of the school of individualism, to which he professes a bitter opposition” (Newcomb 1886b, p. 540).

Ely’s reply to Newcomb came out two weeks later. His response, “The Economic Discussion in Science,” appeared in the issue of July 2nd, 1886. Ely begins by asserting how difficult it is to discuss the most important issues regarding the nature of science and economics in a series of exchanges in a periodical. He maintains that the articles of Seligman, James, and himself are “scarcely more than suggestive” of the views of the new school of political economy. However with regard to Newcomb, Ely has no doubts. Newcomb’s ideas are clearly wrong. At one point he holds that he would need a large volume “to expose all the errors which, in my opinion, are implied in the article of the distinguished mathematician of the Johns Hopkins university” (Ely 1886c, p. 4). Before taking up these errors, there is one implication which must be cleared up. Ely believes that

Newcomb has identified him as a socialist:

There seems to be an implication, though doubtless inadvertent, in the article of my of learned colleague, that I am a socialist. True, I believe that the state has its industrial sphere, and that a larger one than many have been inclined to think; but I hold quite strenuously that the individual has a sphere of economic action which is an equally important one. I condemn alike that individualism which would allow the state no room for industrial activity, and that socialism which would absorb in the state the functions of the individual....among those who are known as the new school of political economists, there is not a single one who could be called an adherent of socialism, pure and simple. It is, I believe further, safe to assert that pure socialism is advocated by no teacher of political economy in any American college or university (Ely 1886c, p. 4).

Ely's most important difference with Newcomb is that he believes that economics cannot become a mathematical science like physics and astronomy. At one point Ely remarks: "I am unable to agree with him; for he speaks as if political economy were a mathematical science, with a body of truth unchangeable and eternal..." He more broadly asserts his view subsequently claiming that:

Professor Newcomb fails to distinguish between mathematical sciences and those which are more descriptive in their nature, and have to do with growing, changing bodies.

This brings us naturally to Professor Newcomb's objection to my conception of economics as a science concerned with what ought to be, – an objection which it seems to me, though very natural in a mathematician, is not valid (Ely 1886c, p. 5).

Ely's remark about growing, changing bodies seems to imply an evolutionary and historical point of view. Apparently, Ely interprets Newcomb's Principles and his other writings on economics as being non-evolutionary and non-historical in their methodology. In contrast, the methods of the New School are descriptive rather than quantitative or mathematical.

Ely's remark about the methods of the New School being different drew another reply from Newcomb. His rebuttal, "Can Economists Agree Upon the Basis of Their Teachings," appeared in the very next issue of Science on July 9th, 1886. The thrust of Newcomb's response was to compare the teaching of economics with the teaching of physics. Newcomb maintained that some professors

like to teach physics with an emphasis on experiments and the experimental method in conveying the basic ideas of physics. Others like to teach physics with mathematical reasoning and emphasize mathematical formulas in that subject. However, the differences between the two approaches to teaching physics are not a source of antagonism according to Newcomb. In contrast, in political economy there are two schools which have teaching methods analogous to the two approaches to teaching physics. In economics, however, the old school and the new school are quite antagonistic with each other. At this point, for the sake of discussion Newcomb assumes that the purpose of economics is to distinguish which public measures would improve society and those which may cause damage or injury. He asks whether the students of economics should be educated in the descriptive facts characterizing various aspects of economics activity or whether they should be taught the reasoning methods of scientific inquiry. Newcomb imagines one man being trained in the descriptive techniques of the new school and the other in the methods of the exact or physical sciences. Newcomb is clear that he regards neither person as well trained:

Which man is better equipped to answer an economic question? I reply, that, taking them as they stand, neither is well-equipped. But the second man has this advantage over the first, – that, when the question is presented to him, he will know how to investigate it, and, with the aid of better informed men, will be able to find out the essential facts for himself, while the other man will never be able to make any really valuable use of his knowledge. Hence, I prefer a system of instruction which is more concerned in teaching the student how to think and investigate, than in storing his mind with facts (Newcomb 1886c, p. 26).³⁷

7. The Social Gospel and the Founding of the American Economic Association

This debate between the old and new schools of political economy with Newcomb defending the old school and Ely and his colleagues energetically advancing a new view happened nearly simultaneously with the founding of the American Economic Association (AEA) in 1885. An attempt to form the Society for the Study of National Economy modeled on the German organization with a similar name had failed.³⁸ Edmund James and Simon Patten of the University of Pennsylvania had attempted to organize economists into such a society. James was a good friend of Ely's and Ely moved to form the AEA after their efforts failed. Ely took it upon himself to issue a call for the formation of "The American Economic Association." He wrote a prospectus outlining the purposes of the new association aiming to appeal to the younger generation of economists. Among the objectives of the association were enhancing research, publication of monographs,

freedom of discussion and a bureau of information. A platform contained four main principles:

1. that the state is a positive force in human progress;
2. that political economy is in the early stages of scientific development;
3. that the conflicts between labor and capital require the joint efforts of church, state, and science; and
4. that the association takes no position on issues such as free trade.

However, the association maintained that economic conditions could be improved with changes in economic policy. In preparing the prospectus, Ely tells us that he was assisted by his Johns Hopkins colleague H. B. Adams. The year before, Adams had been instrumental in creating the American Historical Association. Ely and others proposed that those economists interested in creating the American Economic Association should meet at the next meeting of the American Historical Association. Thus on September 8th of 1885, the economists attending the historical associations meetings met at 4 PM in Saratoga Springs, New York for the purpose of forming the American Economic Association. Before this inaugural meeting and after the platform had been written, Ely conveyed the news to President Gilman: “The proposals seem to be very favorable for an influential movement which will help in the diffusion of a sound, Christian political economy. At the same time, I trust it may benefit the Johns Hopkins University.”³⁹

The first publication of the AEA was a report put together by Ely on how the association was organized. Ely includes the statements of objectives and its platform. Then he provides comments from letters written by some of those in attendance and includes two newspaper accounts of the founding of the AEA. Among the comments are those of some prominent clergy men. The Rev. Dr. Lyman Abbott, associated with a publication known as the Christian Union conveyed these remarks in his letter to Ely:

I need hardly to say that I am cordially glad to see an organic effort made to develop a more Christian and, as I believe, a more truly scientific political economy. I shall be glad to co-operate in any way in my power in promoting your plans and purpose (Abbot in Ely 1886d, p. 119).

After the founding meeting, an article appeared in the Christian Union reporting and commenting on the appearance of the this new association of professional economists. It was one of the news articles included in the first monograph of the AEA. The article begins by noting that political economy is known as the “dismal science” and it is filled with truisms. The author of the unsigned piece, likely reflecting Abbot’s point of view, maintains that economics has been flawed from a

Christian perspective:

It [political economy] has been palpably an unchristian science, for it has been avowedly organized selfishness. It is based on the assumption that the only motive for human action in trade and commerce worth considering is the motive of self-interest....No less was this political economy unscientific (Christian Union in Ely 1886d, p. 120).

The article continues noting the appearance of a new generation of economists, a “new school” which originated in Germany with an inductive method interested in basing economics on statistical and historical material. The author claims that the new school will be decidedly Christian in its point of view:

In this country this new school of political economy, which, because it is inductive and truly scientific, finds itself compelled to be Christian – since Christianity is the highest form of the science of human nature – has, as yet, not acquired the influence on public opinion which it is destined to wield in the near future. There are very few prominent daily or weekly newspapers which habitually recognize either Christian principle or extended, pains-taking observation in the treatment of industrial or sociological questions. There are, however, numerous young progressive men in our colleges who have cast off allegiance to the old political economy, and who propose to unite with others like-minded in the formation of an American economic association (Christian Union in Ely 1886d, p. 121).

In its parting comments, the Christian Union lauded the creation of a new association which would “recognize in man some other and higher motive than that of self-interest.”⁴⁰ Abbot’s views were shared by a number of the founders of the AEA. Apparently, at least 23 of the fifty original attendees at Saratoga were active or former clergy.⁴¹

Years later in a manuscript dated for 1931 and just recently published, Ely would give us his interpretation of the founding of the AEA. His attitude is clear from the title of the relevant chapter, “New Life in American Economics.” While the controversies over political economy in Science in the mid 1880s led many to focus on differences in scientific method between the old and new schools, this really missed the point as far as Ely was concerned. The controversy took on the German name for differences in method and became known as the “Methodenstreit” in the history

of economics. Ely claimed that the talk about method “concerned things that were merely on the surface, and did not at all get down to those things which were really fundamental” (Ely 1931, p. 210). Instead he claimed the conflict was about something else:

What we young fellows were concerned about was life itself, and the controversy in regard to methodology was simply a surface indication of forces operating more deeply. We believed that economics had, in itself, the potency of life. It was interesting to us and, I may say, thrilling. In the vast field of research which lay before us, and through research, the opening up of fields which had been cultivated only to a limited extent, we felt that we had before us opportunities for service of many kinds. We had found among our teachers in Germany a warm humanitarianism, and that inspired us (Ely 1931, p. 211).

What was it that the young economists of the new school saw in the economy that needed so much attention? Ely goes on to describe how they viewed the problems of a market economy in the mid 1880s. After calling attention to differences over the plight of workers he continues:

We saw a good deal of poverty on the one hand and a concentration of wealth on the other hand, and we did not feel that all was well with our country. We felt that something should be done to bring about better conditions. We had a glimpse into the fundamental institutions of economic life and discovered that they were in a state of flux. We had learned the idea of evolution and never ceasing change as a condition of life. We thought that by getting down into this life and studying it carefully, we would be able to do something toward directing the great forces shaping our life, and directing them in such a way as to bring improvement (Ely 1931, p. 211).

This extraordinary passage continues. Ely next claims that the two most fundamental ideas of the new school were “evolution” and “relativity.” These ideas vastly exceeded some mere debate over scientific method in Ely’s view. He wanted to change economics so that the world could be changed: “A new world was coming into existence, and if this world was to be a better world, we knew that we must have a new economics to go along with it” (Ely 1931, p. 211). Ely recollections about the period surrounding the AEA brought back memories of Newcomb as well:⁴²

One of the chief defenders of the old “economical creed” was Simon Newcomb, mathematician and astronomer, with whom I was associated in Johns Hopkins University, early in my career. Before going on...let me give you an illustration of the kind of treatment the younger “non-orthodox” economists of that time received, in this country, at the hands of these “Die-hards” of the Manchester School (Ely 1931, p. 177).

Ely goes on to describe how he and Newcomb clashed over the labor question. Both men had written books on the labor problem that had appeared in 1886. Ely felt that he had written “an honest work” and a “fearless work.”⁴³ While it had some flaws, Ely thought that he was unfairly criticized by Newcomb. Newcomb went so far as to question his fitness for an academic position:

Simon Newcomb was a man of an older generation than my own and with a great reputation. I had the feeling then, and have it strongly now, that he should have reached out a friendly and encouraging hand to me when, as a young fellow in my twenties I joined the staff of the Johns Hopkins University. But, when my book appeared, Newcomb wrote a review of it for the New York Nation, and closed with the words that the writer of such a book “seems to us to be seriously out of place in a University chair” (Ely 1931, p. 177).

Newcomb’s comment obviously would have drawn responses from others. Ely’s department chair, H. B. Adams, let Ely know that, in his opinion, Newcomb wanted the professorship in economics at Johns Hopkins for himself. Apparently Frank Taussig, one of the younger economists at Harvard, was so upset at Newcomb’s attack that he was moved to join the AEA at that point. Newcomb had other ways to make Ely uncomfortable at Johns Hopkins. Because of his interest in economics and due to the fact that faculty from other disciplines participated in doctoral examinations Newcomb was often on the examining committees of the doctoral students in political economy. Ely relates how difficult these shared doctoral examinations often became:

Newcomb’s mathematical mind worked quicker than my own, and in examinations, he tried to show up my students unfavorably by putting to them questions, more or less in the form of mathematical problems, which they could not answer well on the spur of the moment. Perhaps I was more sensitive than I should have been, but I was irritated and greatly troubled (Ely 1931, p. 177).

Newcomb's memory of the doctoral exams at Johns Hopkins was much less negative than Ely's. Newcomb thought the conduct of the exams was one of the best features of the university:

As Professor Ely is still a leader on the stage, I desire to do him justice at one point. I am able to do so because of what I have always regarded as one of the best features of the Johns Hopkins University – the unity of action which pervaded its work....The examinations of students for the degree Doctor of Philosophy were then, as now, all conducted by a single "Board of University Studies," in which all had equal powers, although no member of the board took an active part in cases which lay entirely outside of his field. But the general idea was that of mutual cooperation and criticism all through. Each professor was a factor in the department of another in a helpful and not an antagonistic way, and all held counsel on subjects where the knowledge of all was helpful to each. I cannot but think that the wonderful success of the Johns Hopkins University is largely due to this feature of its activity, which tended to broaden both professors and students alike (Newcomb 1903, pp. 406-407).

Because of the religious affiliations and Christian outlook of so many of the founders of the AEA and the interest of many of them in socialism in general or a Christian socialism in particular, one of the issues facing the new organization was how pluralistic it would be. A fear emerged that the AEA would identify with or become an organization advocating socialism.⁴⁴ This issue focused on social problems such as the plight of the worker and whether labor unions should be given a legitimate role in the economy. At one point, Newcomb took on the first president of the AEA Francis A. Walker. Besides his concerns about socialism, Newcomb feared that the AEA would function something like a church with a creed. However, the AEA eventually muted its moral aims and became a more open organization. Newcomb saw this as an improvement in the function of the AEA.⁴⁵

8. A Pythagorean Brotherhood of Self-Sacrificing Science Advisors

Peirce's prominent critique of economics and Newcomb's Political Economy in the last article of The Monist series surely tells us that Peirce had his eye on the two-schools debate in economics as it unfolded in the mid 1880s. That series published the main ideas of his mathematically themed evolutionary cosmology. The economics debate involved the new school founders of the American Economics Association and Simon Newcomb as the principal antagonist of the old school. Economists intensely debated the role of scientific method and Christian ideals

as they relate to the practices of economic science. The articles of The Monist series also appear to be a response to at least two other significant controversies related to science and religious topics. There is evidence to suggest that Peirce was also attuned to the earlier two-schools conflict over science and Christianity as expressed between prominent theologians and Newcomb in the “Law and Design” debate of 1879. Also, the very title of that last article in The Monist, “Evolutionary Love,” conveys a direct and obvious religious theme. Peirce took the Christian term for self-sacrificing love, agape, as the term denominating his conception of evolution by higher purposes.

While developing evolutionary philosophical system in The Monist series, Peirce did take the time to do something quite unusual and even unexpected. In a short series of articles in The Open Court that have hardly received any attention from anyone since they were written, Peirce gives us something of a surprise. He essentially outlines his view of how a scientifically trained policy advisor to government should be educated and trained. Here he is intentionally taking his evolutionary cosmology to a very practical level. Perhaps Peirce felt compelled to show that his new philosophical system could be used as a framework for advising government in a scientific way. This clearly takes us back to economics. If one had any doubts that Peirce was affected significantly by the debates between the two schools of economists, this series of articles leaves no doubt. The very practical topic of how to give appropriate scientific policy advice to government was a central element of the controversies between economists in the 1880s and early 1890s. The new school argued for a much larger role of government in dealing with the economic problems of America in the late 19th century. The old school tended to advocate a smaller role consistent with laissez faire and free markets as understood in British classical political economy.

Peirce’s evolutionary philosophical system at its heart was mathematical in conception. He saw humans as having become endowed with minds which allowed them to apprehend basic qualitative relations in their surroundings. Qualitative relations that persist would become the basis of symbols permitting the development of words, language, and art. Qualitative relations also could be represented with mathematics and symbolic logic. If qualitative relations became rigidly stable, then units of measure could be defined thus enabling quantification and eventually scientific investigation. In the nineteenth century, it was recognized that science advanced by measuring and quantifying rigid patterns of phenomena that often could be summarized with mathematical formulas. Coupled with stable units of measure, scientific investigation could lead to the estimation of important parameters in scientific equations. Thus the effort by the Coast Survey to estimate numerically the size of gravity coefficients at locations around North America. Peirce also recognized the importance of large-scale sampling. In this regard, economics with its theory of perfect competition assuming an unlimited number of producers and consumers was one of the first

scientific disciplines to recognize the importance of scientific properties of large-sample populations. Peirce actually thought that the emphasis on a large-number theory of competition in economics had inspired Darwin to look at the patterns of development in animals over very large numbers and over vast periods of time. In astronomy with his mapping of the stars of the milky way galaxy, Peirce was following a method of large-number observation taking inspiration from economics and biology. Perhaps this is another reason why Peirce paid so much attention to economics.

With regard to the philosophical positions of either of the two schools in economics, Peirce would have seen them both as incomplete. Newcomb, like many of the other old schoolers who had adopted the tenets of English classical political economy, would have adopted the British empiricism and utilitarianism of John Stuart Mill as starting points for more broadly interpreting economics. Some American economists had preferred the common sense realism of the Scottish school to Mill's empiricism, but Mill's empiricism was being increasingly accepted by the English political economists who dominated that discipline in the 1880s and 1890s. Recall that Peirce had criticized the ideas of James and John Stuart Mill on economic grounds years earlier. The new schoolers in contrast had traveled to Germany and picked up the Hegelian outlook of their professors. Peirce's critical comments on Hegel can be interpreted in part as a critique articulated both for the benefit of prominent new school economists and for those theologians who favored an Hegelian approach to the basic philosophical premises of their theological positions. Peirce was creating an alternative philosophical position for both of the dominant philosophical traditions of his time – those of the British and the Germans, and, in economics – for the old and new schools of economics.

In the six articles published in The Open Court Peirce portrays how policy advisors should be trained in logic, science, and moral principles. They would be trained in logic to be a critic of arguments, in science in order to use techniques of quantification, and in the highest of moral principles so that they could give wise advice to government. Using the history of mathematics to embellish his ideas, Peirce sees a modern, scientific version of an ancient group of specialists who were trained in the operations of measuring and numbering – the Pythagoreans. Using his creative imagination, Peirce asserts that what society needs is a modern Pythagorean brotherhood educated in science, logic, and moral principles who would then be capable of giving prudent and informed advice to government. Read in appropriate historical context, Peirce in The Open Court articles outlines how scientists and economists ought to be educated so that they will make good policy advisors and give reasonable and judicious advice to government. In this series, Peirce ranges over the principles of logic, a description of the Pythagorean brotherhood, the relationship between science and religion, and an essay on the contributions of the Christian faith. Also in this series,

Peirce chooses economics and an economic problem to illustrate the role of the policy advisor functioning in the context of his evolutionary philosophical system. One of those articles, “Dmesis,” is an application of economic analysis to the problems of crime and punishment. Thus it is clear that Peirce’s metaphysical writings of the early 1890s were influenced by his interest in economics and the economic controversies of that era. The titles of The Open Court series in their order of appearance are as follows:

“Pythagorics”

“The Critic of Arguments. I. Exact Thinking”

“Dmesis”

“The Critic of Arguments. II. The Reader is Introduced to Relatives”

“The Marriage of Religion and Science”

“What is Christian Faith?”

Here the focus will mainly be on “Pythagorics” and with a brief mention of “Dmesis.”

On the surface “Pythagorics” sounds like an article on the history or philosophy of mathematics. The reason for naming the lead article is given after introducing the purpose of the series:

The pleadings will make up a series of briefs, or articles, to be entitled “The Critic of Arguments,” the word critic here meaning an art, like logic, etc. But I shall beg leave to intersperse among these essays others relating to points in the history of human reason, treated mostly with special reference to the practical lessons they suggest (Peirce 1892d, HP 1, p. 557).

Before beginning the development of the themes of the essay what comes first is an interlude that indicates how dire Peirce’s personal financial situation had become. The article is about a secret scientific brotherhood named after Pythagoras. Peirce no doubt sees himself as a member of that brotherhood, yet the members are not as well compensated in America as they are in Europe. Newcomb had made this point about American science previously in his pieces on the state of science in American in the 1870s and Peirce restates the point no doubt with his own situation in mind.

The next part of the article portrays the main but contested features of the life of Pythagoras in the sixth century B. C. Peirce maintains that Pythagoras actually lived and that he inspired a

secret society with one main purpose of influencing government:

At any rate, it is certain that Pythagoras really lived, and that in the sixth century before Christ...he established....a secret scientific society, one main purpose of which was to control the policy and conduct of the government, and to sway the minds of citizens (Peirce, 1892d, HP 1, p. 559).

Apparently the ancient Pythagoreans attached philosophical and moral principles to numbers and made many mathematical discoveries which they apparently kept secret. At one point, Peirce asserts an economic motivation for this secrecy: “they must have earned their living by the practice of the mathematical arts – computation, book-keeping, mensuration, etc.” and for this reason “it would plainly be to the interest of the guild” that this “should remain a mystery to outsiders.”⁴⁶ One of the mysteries was the creation of a ten-columned abacus which would have facilitated computation. Apparently, the roots of the device go back to ancient Babylon, but it is clear that such a device helped the Pythagoreans earn their livelihood.

From the ancient Pythagoreans, Peirce imagines a modern scientific brotherhood with the same name. Apparently, there would be a sizable number of men and women dedicated to science even in Peirce’s time. Peirce describes the modern incarnation of the brotherhood as being exceptionally devoted to the matters at hand:

[The brotherhood was as] sincerely devoted to pure science as Pythagoras and his school assuredly were, yet their association by no means neglected practical objects, nor failed to pursue them in a thoroughly practical way.

This brings me to the modern Pythagorean brotherhood, the rumor of which has reached my ears. I understand that it is composed of three hundred men and women whose lives are solemnly consecrated to science (Peirce 1892d, HP 1, p. 561).

They were sworn to a probationary period of celibacy while they apply science to the practical problems of life and formulate what they have learned as principles of wisdom and virtue. Once these principles have been formed, the brotherhood is to offer itself to govern the rest of the world:

But the first forty years of the new life of Pythagoric rule is regarded by all of them as a probationary period, during which they must practice a degree of self-abnegation

and submit to a rigor of discipline which at a later time can be relaxed. Meantime, the corporation will be husbanding its resources and gathering strength for the great work that lies before it (Peirce 1892d, HP 1, pp. 561-562).

Once the brotherhood has learned a great deal about truth and become among the wisest and most virtuous of all of humanity, then the next task will be to offer their views for governing society:

The next step will be to subject the rest of mankind to the governance of these chosen best. This is to be accomplished by pitting their superior virtue, science, and wisdom, against the wickedness, the vanity, the credenciveness, and the cowardice of the common herd. In this conduct, they will not be handicapped, like the Church, by being committed to a mass of lies (Peirce 1892d, HP 1, p. 562).

Clearly Peirce views the modern Pythagoreans as being driven by higher rather than lower purposes and they serve as another example of the agapasm of higher purposes described in “Evolutionary Love.”

To this point we have seen that Peirce had made a critique of Newcomb’s Principles of Political Economy a center piece of his last essay on creative evolution in The Monist metaphysical series. And he also outlined a conception of a mathematically and scientifically trained policy advisor to government in the articles of The Open Court series. In the last article from this series, “Dmesis,” Peirce considers the rationale for criminal punishments and how criminals can be both humanely and efficiently treated. Apparently dmesis means “breaking or taming the wild.”⁴⁷ In the late 19th century, some economists were debating the economic implications of law and the role of government intervention in society. Tariffs versus free trade was a common debate and regulation of railroads and public utilities. In this piece, Peirce considers utilitarian or economic arguments as disincentives to crime and holds that they do not work. Instead he argues for an application of Christian principles to rehabilitating criminals. He urges that they be placed in asylums and treated very well. In the long run, he maintains that this would be a more efficient and less costly way to deal with crime than incarcerating criminals in prisons and treating them harshly. In his comments it is clear that he is thinking about how the broad principles of Christianity can be applied in government policies:

In order to illustrate how I would conceive that the policy of the State ought to be governed by Christian Faith, let me ask upon what justifiable pretense do we punish

criminals? They are secluded from everything beautiful and elevating, and are treated in the harshest manner and the most tetrical spirit, and just as they are settling down to this mode of life, are turned out, to be caught again in a few months; and this is repeated over and over again, all their lives long (Peirce 1892f, pp. 30-31).

Peirce continues with an argument implying that treatment of criminals is harsh and ineffective. Peirce continues asking by what authority are criminals so harshly punished. Some base the treatment of criminals on the Bible. However, Peirce rejects the harshest passages of the Bible regarding vengeance and retribution as unchristian. Other justifications for punishment are self-preservation, a higher duty of government to maintain true religion and virtue, and the utilitarian principle of the greatest good to the greatest number.⁴⁸ After such an emphatic rejection of the utilitarian basis of punishment ostensibly on Christian moral principles, Peirce offers a critique of another reason for favoring punishment on utilitarian grounds. Peirce rejects the deterrence argument. He maintains that a large class of criminals repeat their crimes often within minutes of being released from prison even after years of incarceration. He does acknowledge that a threat of punishment can alter the types of crimes that get committed and can deter a few otherwise respectable people from yielding to temptation.

Having rejected the most widely accepted ideas regarding punishment and the justifications for punishment, Peirce next outlines his plan for a much different penal system:

A friend looking over my shoulder, asks: “How would you treat criminals, then? Me? Oh, well, you know I am no penologist; and perhaps I could not give a very wise answer to that question. But I should love them; and should try to treat them with loving kindness in the light of truth, and should hope for the blessing of heaven on my effort. I know that they are deformed and diseased souls. I feel that their being so is, in some unknown measure, the fault of our own grinding selfishness, our thoughtless dishonesty. Some degree of care and tenderness we owe them as a debt, and the residue not so owing I would give them if I could. They are weak and miserable, and need better care than other people (Peirce 1892f, p. 33).⁴⁹

The theme of love returns us to where we began with “Evolutionary Love” in The Monist series. Here Peirce is arguing that criminals should be treated as though they can be turned toward higher purposes rather than the lower endeavors of the life of the criminal.

9. Conclusions

An exploration of the broader strands of intellectual currents in America in the late 19th century reveals an extraordinary and previously unrecognized response to the conceptual issues raised as the American Economic Association was founded in the 1880s. The evolutionary metaphysical essays of Charles Sanders Peirce in both The Monist and The Open Court essays of the early 1890s were written, in part, as a response to the philosophical, scientific, and religious positions taken by the leading figures of the economics profession during that historical episode. The controversies among economists, known as the new and old schools of political economy, constituted an American methodenstreit which mostly took place in the pages of Science. Simon Newcomb, a life-long scientific colleague and nemesis of Peirce, was the leading figure of the old school and Richard Ely, a younger colleague of both Newcomb and Peirce's at Johns Hopkins was the most prominent figure of the new school of political economy. In The Monist series, in its last article, "Evolutionary Love," Peirce criticizes Newcomb's political economy as an eros of lower purposes. In contrast, Peirce maintains that human social evolution can be driven by higher purposes calling such a conception of processes of change agapastic evolution. Agapastic evolution is a logical generalization of the moral principles of Christianity. In The Open Court series, Peirce takes another step and develops the notion of a logically and morally trained, self-sacrificing science advisor who functions like a critic of government policies. These are the types of individuals who Peirce thinks should govern us.

Peirce's evolutionary conception of science and economics would be different than either Newcomb's or Ely's. Peirce would use mathematical and inferential statistical methods in the context of his evolutionary conception of the natural and social worlds and the role of human inquiry in those worlds. Economics would become a more mathematical discipline if Peirce had his way. Also, Peirce would have welcomed the broader evolutionary cultural and economic patterns identified in the research of the young new school economists. Those qualitative patterns of inquiry would have been consistent with his interests in viewing evolution with a qualitative logic of mathematical relations. Certainly Peirce would have supported the agapastic aims of the new school and others who thought American society needed to be more humane. Instead of following the logic and methods of John Stuart Mill in economics as Newcomb recommended, Peirce would have substituted his own conception of pragmatism. Mechanistic and equilibrium methods would not be discarded as the new schoolers seemed to suggest. Instead mechanistic and equilibrium methods would be seen as being nested within broader evolutionary process in the natural and social worlds.

Appendix: Newcomb's Anonymous Essays on Religion

While Newcomb took great care to be respectful of the views of the theologians in the “Law and Design” debate, he did take much stronger positions regarding evolution and Christianity in two anonymous articles. The title of his first article clearly shows his rejection of orthodox religious beliefs. “An Advertisement for a New Religion” was published the year prior to the “Law and Design” exchange in 1878 and signed as “An Evolutionist.” He boldly asserts “all the old religions, including Christianity, in one sense the best and in another the worst of them, are waxing old, and must soon die.”⁵⁰ Newcomb describes the rise of philosophy and science and that the best intellects of both domains increasingly question religious doctrines. He mentions how the ideas of Darwin and Mill have affected beliefs about the existence of God.

While rejecting all of the organized religions of human history, Newcomb does recognize that religious ideas are basic to the human mind. He articulates his point: “But there is a second truth admitted with nearly equal unanimity It is that man has religious instincts – is, in short, a religious animal, and must have some kind of worship.”⁵¹ What Newcomb wants is a new religion compatible with the best science and philosophy of his time. He begins to outline this new religion with doctrines that it must not have:

1. It cannot have a God living and personal....
 2. It cannot insist on a personal immortality of the soul....
 3. There must be no terrors drawn from a day of judgment....
 4. There can be no ghostly sanctions or motives derived from a supernatural power, or a world to come....
 5. Everything beyond what can be seen must be represented as unknown and unknowable....
- (Newcomb 1878, p. 51).

Moving beyond things the new religion should not be, Newcomb recognizes that it is a much more difficult task to describe its positive functions. He notes that Mill and Comte have addressed this issue. They suggest veneration of emotions and ideas that lead to positive impulses in life and thought. Newcomb argues for a silent worship experience if the new religion is to have one. There could be some type of sabbath perhaps on a ten day cycle rather than seven. Also, there could be hymns to nature and the great powers recognized in science.

Near the end of the essay, Newcomb contemplates whether his new religion will gain wide spread acceptability in the future. He again states that he believes that the old religions will eventually die and be replaced with some body of doctrines consistent with his new religion. There is one place where he has doubts about his new religion. He relates the story of one of his daughters who attended a meeting of an intellectual group followed by participation in a worship service at a prominent protestant church:

My daughter when in London went to a Wesleyan meeting one part of the day, and to a Sunday lecture, by Huxley, on another part; and, strange as it may sound, she preferred the sincere shouting, the amens and groans of the Methodist to the worship of “the silent sort,” in which there seemed to be no heart or adoration – except in the organ (Newcomb 1878, p. 56).

Another installment of Newcomb's anonymous religious views appeared about a year and a half later in the December 1879 issue of The North American Review. In "The Religion of Today," Newcomb outlines his skepticism towards religion and Christianity. He portrays a movement towards skepticism by the "leading intellects of the world."⁵² In his next comments, he challenges the acceptance of the main doctrines of Christianity. Ever the scientific observer, Newcomb remarks that the strongest tenets of Christianity are no longer present in many churches:

One suggestive circumstance is seen in the almost total disappearance of the old-fashioned doctrinal sermon from a large class of our fashionable pulpits. A heathen desiring to learn the doctrines of Christianity might attend the best of these churches for a whole year and not hear one word of the torments of hell or the anger of an offended Deity, and not enough of the fall of man or the sacrificial sufferings of Christ to offend the most bigoted disciple of evolution (Newcomb 1879d, p. 554).

Referring again to the bigoted disciple of evolution, Newcomb asks the question why the doctrines of Christianity are being liberalized and why the conduct of the skeptic may have no discernable differences from his Christian neighbors. To his query "Why is this?" Newcomb replies with an economic explanation:

Simply because the demand for doctrinal preaching is dying out. The law of supply and demand in our times controls sermons as well as flour – doctrines as well as goods. Men have ceased to demand doctrines, not necessarily because they have ceased to believe in them, but because they have taken the first step toward unbelief by losing their interest in them. Their faith is dragging its anchors without their knowing it (Newcomb 1879d, p. 554).

In the remainder of the paper, Newcomb closely questions and searches for inconsistencies in the Christian doctrines of original sin, immortality, the divinity of Christ, and he contrasts theism and atheism. In his comments, it is clear that Newcomb regards evolution as a major intellectual challenge for orthodox Christianity and the he personally prefers a position of skepticism. Newcomb closes on an optimistic note claiming that mankind also evolve in their moral and intellectual qualities. He claims that mankind is evolving towards higher conceptions of the good and the interests of others.

Near the end of this piece, Newcomb essentially gives us his personal creed. Taking the voice of the enlightened skeptic or perhaps even an atheist he writes this very personal statement:

I have no belief in a personal Deity, in a moral government of the universe, in Christ as more than a philosopher, or in a future state of rewards and punishments. But I was born with a sense of duty to my fellow man. I was imbued in infancy with the view that, as a member of society, it was my duty to subordinate my own happiness to that of others. My sense of right and wrong was thus developed at a very early age, and by the constant endeavor to do what was right my conscience acquired a constantly increasing development, and asserted more and more its power over my actions. I am not virtuous from any hope of reward or fear of punishment, but only

because I feel that virtue is my highest duty, both to myself and humanity. This feeling has developed to such an extent that the good of my fellow men is now my ruling motive and vice the object of my extreme detestation (Newcomb 1879d, p. 568).

This very last comment brings us back to Newcomb's treatment of Peirce. Newcomb in the last line of his own words above expresses how he extremely detests vice. A similar sentiment was expressed previously quoted regarding Peirce's second marriage. In his letter to Gilman regarding Peirce's second marriage Newcomb remarks: "It is sad to think of the weakness which may accompany genius."⁵³ These remarks, as Newcomb later recognized, contributed to Peirce's dismissal from Johns Hopkins after five prolific years of teaching and scholarship. Returning to the first anonymous article, after expressing concerns about how young women might respond to his conception of a new religion, Newcomb questions how the young men of the country are going to be taught and morally instructed if his new, non-Christian religion would be accepted. He is concerned that young men would take the demise of Christianity as a license for infidelity. After discussing his daughter's preference for Methodist Christianity, he questions the moral discipline of the young men:

But our greatest anxiety is about the young men, our sons, who, of course, have been brought up without a Bible, and without prayer, public or private, and whose reading is in physiology male and female, and in books we have not been able to keep from them; and who go to theatres, which we freely allow, as they are schools of virtue, and see the sort of company in the gallery and the boxes, and go home with some of them simply to know more of them (Newcomb 1878, p. 57).

Newcomb goes on to realize that the bright young men of his day will come to realize that some of the brightest intellects of human history have been promiscuous. Then they may use that awareness to justify their own promiscuity. Newcomb raises the cases of Comte and Mill imagining that he is being questioned by the bright young men around him:

If Comte loved adoringly another woman than his wife, "why," they say, "may not we do the same? If Mr. Mill constantly associated in the tenderest manner with the druggist's wife in the absence of her husband, why may not we have the like privilege?"....We do tell these youths to be moral. But they hint that morality, in the vulgar sense, has been undermined. We do not address to them any appeals drawn from the divine existence and a judgment-day; if we did so, they would laugh in our faces (Newcomb 1878, p. 57).

It is quite clear that Newcomb viewed Peirce as one of the bright young men who would probably have laughed in his face if Newcomb had attempted to admonish him towards a more disciplined personal life style especially in terms of his most intimate relationships with other human beings. One might have hoped that Newcomb would have recognized that Peirce might have known of the promiscuous activities of Comte and Mill and been more forgiving of Peirce. However, as he states in his own words, his attitude of "extreme detestation" of vice may have gotten the better

of him and may explain why he constantly opposed Peirce apparently on grounds of immorality that he could not justify to himself on the basis of his own accepted philosophical principles.

NOTES

1. I first became aware of this aspect of the founding of the AEA upon hearing Brad Bateman (2008) give his presidential address to the History of Economics Society in 2007.
2. Peirce (1893, p. 355).
3. Peirce's remarks on the golden rule are the following:

The movement of love is circular, at one and the same impulse projecting creations into independency and drawing them into harmony. This seems complicated when stated so; but it is fully summed up in the simple formula we call the Golden Rule. This does not, of course, say, Do everything possible to gratify the egoistic impulses of others, but it says, Sacrifice your own perfectionment to the perfectionment of your neighbor. Nor must it for a moment be confounded with the Benthamite, or Helvetian, or Beccarian motto, Act for the greatest good of the greatest number. Love is not directed to abstractions but to persons; not to persons we do not know, nor to numbers of people, but to our own dear ones, our family and neighbors, "Our neighbor," we remember, is one whom we live near, not locally perhaps, but in life and feeling (Peirce 1893b, EP 1, pp. 353-354).

In the preceding passage, Peirce foreshadows what is to come. Peirce contrasts the golden rule with the ethical rule offered by utilitarians from Bentham to James and John Stuart Mill that society should optimize the greatest good of the greatest number. Instead Peirce maintains that the golden rule as an evolutionary principle of love that focuses on the well-being of individual persons as they are known in their most familiar surroundings. Peirce's critique of the doctrines of political economy would be based on this evolutionary interpretation of the golden rule.

4. The quote from the preceding note continues:

Suppose, for example, that I have an idea that interests me. It is my creation. It is my creature; for as shown in last July's Monist, it is a little person. I love it; and I will sink myself into perfecting it. It is not by dealing out cold justice to the circle of my ideas that I can make them grow, but by cherishing and tending them as I would the flowers in my garden (Peirce 1893b, EP 1, p. 354).

5. Peirce's agapasm and evolutionary philosophy are explored in great detail in Hausman (1974 and 1993).
6. While Peirce asserted a primary role for chance in understanding the world, it was resisted by others. But statistical interpretations of science had gained acceptability in the developing discipline of statistics, in thermodynamics, and Quetelet's application of statistics to social issues. Also, Darwinian ideas and utilitarianism when meshed together encourage an excessive

emphasis on self-interest or the “greed philosophy” as Peirce termed it.

7. Peirce (1893b, p. 360).

8. At this point it might appear that there are three entirely separate theories of evolution with one preferred by Peirce. Of course the whole purpose of “Evolutionary Love” was to present his conception of creative love as the highest level of purposive evolution. At one point Peirce renames the three theories and suggests that they are all simultaneously operative in the universe:

Three modes of evolution have thus been brought before us: evolution by fortuitous variation, evolution by mechanical necessity, and evolution by creative love. We may term them tychastic evolution, or tychasm, anancastic evolution, or anacasm, and agapastic evolution, agapasm....On the other hand the mere propositions that absolute chance, mechanical necessity, and the law of love are severally operative in the cosmos may receive names of tychism, anancism, and agapism.

All three modes of evolution are composed of the same general elements. Agapasm exhibits them most clearly....tychasm and anancasm are degenerate forms of agapasm (Peirce 1893b, EP 1, p. 362).

9. The quoted passage can be found in Newcomb (1886a, pp. 534-535).

10. Newcomb (1886a, p. 536).

11. From economists and political economy, Peirce next criticizes Wall Street. In the early 1890s the economy was in one of its deepest recessions since the end of the Civil War. With the growth of the economy came the growth of the publicly traded corporation and the emergence of Wall Street as a financial center for capitalism. The critique that Peirce had directed at economists such as Newcomb as placing too much emphasis on individual self-interest was also directed at Wall Street. Peirce complained about the sharp dealings of Wall Street investors who took advantage of the unwary who do not guard their business interests properly. He even accused the Wall Street sharps of taking advantage of unsuspecting scientific men like himself and passing bad checks such as he had recently received. This no doubt refers to Peirce’s financial interest in a patent for an acetylene light which he had designed. Peirce even criticizes Bernard Mandeville’s idea that private vices may serve a public purpose. This attitude taken to an extreme would assert that charity and benevolence may have an adverse affect on the human race.

12. Before completing this exploration of “Evolutionary Love,” it would be useful to make a preliminary interpretive comment regarding economics. It should be noted that the criticisms addressed towards Hegel in the latter sections of “Evolutionary Love” could also be directed at Newcomb’s Principles and at classical political economy. While Newcomb’s conception of the social process is very different than Hegel’s, self-interest and the mechanics of market interaction take on mechanistic functions of social process in Newcomb’s political economy.

Individuals follow their individual self-interest in a deterministic way and those interests are coordinated through the equilibrating mechanisms of market processes. A paraphrasing of Peirce's critique of Hegel as quoted above for economics would be something like the following: "The economic philosophy is such an anacasticism....Yet, after all, living freedom is practically omitted from its method. The whole movement is that of a vast engine."

13. In his autobiography, Newcomb writes: "About 1862 or 1863 President Thomas Hill, of Harvard University, paid a visit to Washington. I held him in very high esteem. He was a mathematician, and had been the favorite student of Professor Benjamin Peirce; but I did not know that he had interested himself in political economy until, on the occasion in question, I passed an evening with him at the house where he was a guest" (Newcomb 1903, pp. 400-401).

14. Newcomb comments: "The result was much like a slap in the face. With every possible predisposition to look favorably on its teachings, I was unable to find anything in them but the prejudiced judgments of a one-sided thinker, fond of brilliant general propositions which really had nothing serious to rest upon either in fact or reason" (Newcomb 1903, p. 401).

15. Porter was a professor of religion at Yale and one time president of Yale. McCosh was at Princeton and served as president of that institution. Clark was a unitarian minister and taught religion at Harvard at one point. Cook was a well known minister in the Boston area and well known to Dwight Moody, the conservative protestant evangelist. Internet sources indicate that McCosh and Porter were presidents of their institutions when they wrote their responses to Newcomb.

16. Porter (1879, p. 543).

17. McCosh (1879, p. 561).

18. In that book Newcomb maintained that the real strength of an economy during the war was its ability to produce war material above and beyond the basic goods and services needed for society to survive. He was highly critical of both the issuance of paper currency and the abandonment of the convertibility of the dollar into gold by the federal government. So many greenbacks were issued that the U. S. Treasury had a supply of gold sufficient to cover only a mere fraction of the paper notes in circulation. This over supply of currency was also responsible for much of the inflation that occurred during the Civil War. Newcomb actually self-financed the publication of this book (Newcomb 1903, p. 402). Apparently the book garnered the attention of prominent members of the New York financial community which Newcomb considered as more than compensating for the expenses of publication.

19. The full title of Cairnes's work is The Character and Logical Method of Political Economy.

20. One must wonder and realize that Peirce, given his interest in economics, surely would have read this passage. It could have been one of the motivations behind his writing of the "Note on the Theory of the Economy of Research." The first draft of this note is believed to have been written in 1876 although it appeared in print in 1879.

21. See Moyer (1992, p. 99).
22. Barber (2005, p. xiv).
23. The influence of Mill on Newcomb is developed by Moyer (1992, pp. 100-105).
24. Newcomb (1886, p. 13).
25. See Moyer (1992, p. 79).
26. See Barber (2005b, p. 3).
27. See Barber (2005b, p. 67).
28. See Ely (1884, p. 66).
29. In his book, while discussing the role of labor in the economy, Newcomb had maintained that professors trained in one subject often teach another. James takes issue with this comment and specifically claims that Newcomb's attempts to bring order and diminish confusion in political economy will be resented by economists because he is an outsider.
30. In that same issue of Science, Fabian Franklin, still at Johns Hopkins after taking classes from Peirce, offers several points in support of Newcomb. Franklin characterizes James's review as careless. He also counters James's comments that Newcomb has somehow carelessly stumbled into the field of political economy where he had no background. Franklin notes that Newcomb had been involved in discussing national economic issues for at least a quarter of a century. Franklin also contends with the notion that one had to have adopted the ideas of the German economists to be considered up to date. He also asserts that adherence to the ideas of English economists such as Mill and Sidgwick should not be regarded as incompetence.

A week later, December 11, 1885, James replied to both Newcomb and Franklin. Here James tells of the unfortunate typographical error due to the quick turnaround of the publication cycle of these exchanges. In this reply he chose to reinforce Newcomb's approving views on individualism. James provided several quotations from his Principles text where Newcomb extolled the beneficial affects of individual action. Regarding Franklin, James contends that Newcomb shows no knowledge of this emerging school of economics and seems preoccupied with dated theories of the past. In the next issue of Science, December 18, 1885, only Franklin responded. In this brief response he held that James did not understand points made about a bi-metallic monetary system nor did he understand the difference between the methods of science and the practical conclusions of a science.

As 1885 ended, the specific exchanges regarding Newcomb's Principles of Political Economy died down. However, in 1886 another seven articles appeared in Science debating the core ideas of a science of political economy. In late April, another economist with New School views published a long article on how economics had changed over the centuries. Edwin Seligman's piece "Changes in the Tenets of Political Economy with Time," was published on April 28th, 1886. Seligman covers vast historical ground from the ancient Greeks, through the

Middle Ages dominated by the church, through Adam Smith and the emergence of a market economy and the industrial revolution to the emergence of 19th century political economy dominated by the English School. Against this historical backdrop, Seligman like Ely and James before him, argued that the views of the German historical school economists represented an advance relative to the economic ideas of the past represented in the theories of Mill, Malthus, and Ricardo.

31. After Seligman's article, about a month later another exchange took place over the role of the state in the economy. In the May 28th issue of Science in 1886, Edmund James argued for a positive role of the state in economic activity in a piece titled "The State as an Economic Factor." In the same issue is found a response by Frank W. Taussig and a reply to Taussig by James. In his piece, James holds that no economic progress has taken place without an important role by the state. Echoing Newcomb's claim regarding the economic contribution of the organizational skills of the emerging class of new business leaders, James claims that the economic activities of the state constitute "a fundamental economic category." Like management, government is essential for the production and the coordination of economic activity. James also asserts that with the rise of large organizations like railroads it is essential for the state to interfere in the economy in some cases. He concludes that the state is "the great 'silent partner' in every business enterprise" (p. 488). In his reply, Frank Taussig essentially asserts a counter veiling view. He maintains that the economic progress of the 19th century has largely been independent of government intervention. He believes that James's views are "exaggerated, and in essentials incorrect" (p. 489). He concludes by advocating careful and unbiased inquiry regarding the functions of government. In his reply to Taussig, James reasserts many of the arguments he has made already. He especially maintains that the economic role of the state needs to be included for a comprehensive understanding of economic activity.

32. "It is well to describe somewhat more in detail the ethical ideal which animates the new political economy. It is the most perfect development of all human activities in each individual, which can be attained. There are powers in every human being capable of cultivation; and each person, it may be said, accomplishes his end when these powers have attained the largest growth which is possible to them" (Ely 1886a, p. 531).

33. See Ely (1886a, p. 532).

34. See Ely (1886a, p. 532).

35. He reprises themes of Seligman's paper and again provides arguments and examples that the new school economists do not understand the nature of abstraction in science. Newcomb argues again as he had in "The Organization of Labor" in 1880 that abstract, English political economy needs to be reformulated to solve the new economic problems of the late 19th century. He also asserts that English political economy would be part of a sound view of economics and that the principles of that view need to be understood by the public at large.

36. Newcomb (1886, p. 540).

37. The last article in the series presenting the theories of the New School appeared in the July 23rd issue of Science. This article apparently was not written as a direct rebuttal or extension of the previous articles of that year. Richard Mayo Smith wrote a piece titled, “Methods of Investigation in Political Economy.” Here he reasserts many of the aspects of scientific progress brought to political economy by the inductive methods of the New School. He also remarks that the comparative, historical, and statistical methods of the New School will be particularly useful in studying the economic functions of the state. Clearly he sees the methods of the New School as a scientific advance over the older English School of political economy. Like Ely, he believes that the new methods have overthrown those of the old school.

38. These comments follow Ely’s (1931, pp. 206ff) posthumously published account of the founding of the AEA.

39. From a letter of Ely to Gilman quoted in Barber (1993, p. 216).

40. This remark comes from the Christian Union in Ely (1886d, p. 122).

41. See Coats (1993, p. 358).

42. As a way of emphasizing his point, Ely describes the attitude of one of the younger economists who he claimed did not really understand what the creation of the AEA really meant. Ely quotes the young Charles Dunbar of Harvard as one who misunderstood the conflict between the two schools of economics. While Dunbar was a contemporary of and respected by the members of the new school, he was more conservative and held that older views were still valuable. Dunbar thought that the debate was about scientific method and that the new school brought new methods of historical inquiry to economics. Rather than replacing the methods of the old school, they would supplement those methods and bring new methods and problems into the purview of economics: “But, after all, the difference between the old school and the new is essentially a difference of emphasis or of relative weight given to the historical side of the subject and not a radical change of method in arriving at economic truths (Dunbar 1885 in Ely 1931, p. 213). After a long and extensive quote from Dunbar, Ely again claims that “Dunbar did not really understand what it was really all about” (Ely 1931, p. 214).

If Dunbar was depicted as not getting what the AEA was about, one can imagine Ely’s view of Newcomb. In his 1931 book, Ely called those who followed the old school of English political economy, “epigones.” The term and its application comes from a passage in an article of Gustav Schmoller’s that Ely translated and quoted at length. For Schmoller, an epigone is someone who closely follows Adam Smith and the physiocrats in their general philosophy of life, in their political and social ideals, and in their methods of science and literary expression. Identified as epigones are Francis Bowen, the mid 19th century professor of moral philosophy and political economy at Harvard, Henry George the advocate of a single tax on land, and Simon Newcomb. Newcomb actually received another level of criticism beyond being labeled as an epigone, he was also called a “die-hard” of the English classical school of political economy.

43. Ely (1931, p. 177).

44. See Coats (1993, p. 357).

45. General Walker served as president and Ely secretary of the AEA for its first seven years. Walker was mostly a figure respected among both the old and new schools of economists. Near the end of his tenure as president, Walker commented on the developing discipline and what should be taught to the public. In a response in the Nation in 1891, Newcomb chided Walker for making too much about the two schools of political economy. Disparaging the new school, Newcomb critically remarked: “After much careful examination, I have concluded that the qualification required to constitute a new-school man is half a page or so of slighting remark about the economy of Ricardo, Mill, and the English school.” Newcomb then escalates his criticism alleging that the AEA was more of a church than a professional organization:

Had the President of the Economic Association been a man of less sturdy independence, one might have suspected that the remarks to which the Nation takes exception were suggested by previous failure on his part to thus qualify himself, and were the repetition of the creed necessary to his admission to full membership in the new economic church (Newcomb 1891, p. 27).

J. Lawrence Laughlin, originally at Harvard and then at the University of Chicago in the early 1890s refused to join “a class of disciples” and would only join an organization which would search for truth. In a review of two of Ely’s books, Newcomb would repeat the criticisms about Ely trying to establish a professional organization with religious motives in Laughlin’s new academic publication at Chicago, the Journal of Political Economy. The review begins by noting that Ely became a prominent figure in economics about a decade earlier. Ely had criticized the old school of Ricardo and the English economists arguing for a new school that was historical and statistical that would replace the old school. Newcomb again contends that Ely’s new organization would be something like a religious organization:

He [Ely] became a leading spirit in the formation of the American Economic Association, which he intended to be a sort of church, requiring for admission to its full communion a renunciation of ancient errors, and an adherence to the supposed creed.....As a church, or even a new school, his organization proved unsuccessful, partly from want of the opposition necessary to the healthy growth of such an institution, and partly from his own failure to show that there was anything really new in the ideas or methods of his would-be new system (Newcomb 1894, p.106).

While Ely’s narrower vision of the AEA marked its earliest years, the association gradually became more pluralistic. Walker apparently made his reservations with Ely’s original platform quite clear to the younger members of the AEA. In the 1892 meeting, objectionable language was dropped and Charles Dunbar of Harvard was chosen as its second president. Dunbar was one of the more conservative members of the younger generation of economists. He was the one who Ely would later assert did not understand the full significance of the early years of the AEA. By the early 1890s, the AEA was beginning to publish research monographs and Harvard had

begun to publish the Quarterly Journal of Economics a few years before Chicago began the Journal of Political Economy. It had elected new leaders. By 1894, attitudes within the AEA became sufficiently tolerant so that Newcomb became a member. Laughlin would hold out for another decade becoming a member in 1904.

In his memoir of 1903, Newcomb looked back on the development of the economics profession and his relationship with Ely. Regarding Ely's visions and his own contributions, Newcomb tells us:

The development of economic study in our country during the last quarter of the last century is hardly any less remarkable than that of mathematical science. A great impulse in this direction was given by Professor R. T. Ely, who, when the Johns Hopkins University was organized, became its leading teacher in economics. He had recently come from Germany, where he had imbibed what was supposed to be a new gospel in economics, and he now appeared as the evangelist of what was termed the historical school. My own studies were of course too far removed from this school to be a factor in it. But, so far as I was able, I fought the idea of there being two schools, or of any necessary antagonism between the results of two methods (Newcomb 1903, pp. 404-405).

Then Newcomb describes Ely's prominent role in the founding of the American Economics Association and he restates his view at how narrow he thought Ely's conception of the economics profession was:

One of Professor Ely's early movements resulted in the organization of the American Economic Association. His original plan was that this society should have something like a creed to which its members subscribe. A discussion of the whole subject appeared in the pages of "Science," a number of the leading economists of the country being contributors to it (Newcomb 1903, pp. 406).

Newcomb's next comments note how the American Economic Association from a single framework or school of thought to a more pluralistic professional organization:

The outcome of the whole matter has been a triumph for what most men will now consider reason and good sense. The Economic Association was scarcely more than organized when it broke loose from all creeds and admitted into its ranks investigators of the subject belonging to every class. I think the last discussion on the question of two schools occurred at the New York meeting, about 1895, after which the whole matter was dropped and the association worked together as a unit (Newcomb 1903, pp. 406).

46. See Peirce (1892d, HP 1 p. 560).

47. This definition was offered after inquiry in conversation by Andre De Tienne at the Peirce Edition Project in Indianapolis on August 19, 1999.

48. After considering several justifications for the punishment of criminals, Peirce reduces the list to two. One is a general utility of pleasure and pain and the other is self-preservation. Both principles have their effects with regard to the future. Peirce links these justifications to the effect of punishment in deterring future crimes:

These [justifications] connect themselves with the right to punish only upon the supposition that punishment goes to prevent crime. Upon these principles, then, punishment is inflicted solely in view of its effects in the future, and not at all in retribution for the past. Punishment, as so justified, ceases to be punishment, it is only prophylaxy (Peirce 1892f, p. 32).

Peirce continues rejecting the argument that self-preservation of government as a reason for inflicting punishments on criminals. He seems to make illusions to the property damages by the army during the Civil War asserting that self-preservation does not justify private property being used for military purposes to preserve the union. Apparently he believes that the arguments for self-preservation by acts of government are logically similar with regard to war and punishment. Next Peirce offers a critique of the utilitarian position on punishment maintaining that it violates the basic principles of Christianity:

But if the attempt to justify punishment by the principle of self-preservation is ridiculous the attempt to justify it on utilitarian grounds is far worse. It is barbarous, revolting, and unchristian. The idea of putting a man to death, or, more dreadful still, of imprisoning him for years, deadening his soul and disgracing him for life, not for any guilt of his, but just for the sake of distributing to each unit of the population a fraction of a cent's worth of additional security! Why, such a principle would reduce cannibalism to a question of how much meat a man would yield! The Christian conscience condemns such villany with its strongest emphasis! Utilitarianism is the spirit of hell (Peirce 1892f, p. 32).

49. What follows is a specific eleven point plan which would put criminals in the care of specialists in materially nice surroundings and require them to do meaningful work. After spelling out some aspects of his plan, Peirce gives a qualitative forecast of the consequences of this new system for dealing with criminals. The effect on criminals and crime could be dramatic. Peirce asserts that in a short amount of time most of the criminals will be in asylums. He also believes the criminal justice system will work more expeditiously: convictions will be quicker, defense of criminals will be weaker, and confinement time will be much longer – years instead of a few weeks or months. The preceding mean that habitual crime should be brought to an end. Peirce also believes that criminals will be as happy as they can be and most of them will become industrious. A large minority of them could return to self-respecting citizenship.

Having outlined his system and some of the consequences of that system, Peirce goes off into a rhetorical interlude reminiscent of the opening passages from “Evolutionary Love” on love, Christianity, and its later passages on economics as the gospel of greed. He believes that the most important effect of his new system of punishment is that society will no longer publicly disavow or hate criminals. His rhetoric of two different gospels echoes the rhetoric of the prior

two-schools debates both in economics and in The North American Review. He seems to imply that there are two gospels in economics and he prefers the more Christian gospel of the new school economists. Peirce's words at this point can be found at the very head of this essay. As soon as the state adopts a plan such as Peirce's, he believes the state will have committed itself to the gospel of love and rejected the gospel of hate. Such a system would elevate the spiritual state of each person in the country.

Near the end of "Dmesis," Peirce provides a qualitative estimate of the costs of his new plan. Because his new system would keep repeat offenders in treatment, Peirce argues that there would be a considerable savings by reducing significantly the number of judicial proceedings. Initially, start up costs of the new system would make it quite expensive, but eventually it would become fully self-supporting as the patients increased their productive activities. Also, Peirce argues that the private costs of crime would fall greatly. Last Peirce rejects the idea that his system of asylums would be so nice that they would induce people to commit crimes just so they could receive the benefits of his new system of asylums for criminals.

50. Newcomb (1878, p. 44).

51. Newcomb (1878, p. 46).

52. Newcomb (1879, p. 553).

53. The quote is on the fifth page of this chapter.

References

Peirce References Using Abbreviations¹

- WP Writings of Charles S. Peirce, 6 volumes, Indiana University Press
EP The Essential Peirce, 2 volumes, Indiana University Press
CP Collected Papers of Charles Sanders Peirce, 8 volumes, Harvard University Press
HP Historical Perspectives on Peirce's Logic of Science, Carolyn Eisele, ed., 2 volumes
NEM New Elements of Mathematics by C. S. Peirce, Carolyn Eisele, ed., 4 volumes.
CTN Charles Sanders Peirce: Contributions to the Nation, K. L. Ketner and J. E. Cook, eds.
CDC The Century Dictionary and Cyclopedia, editor-in-chief, Wm. D. Whitney.
DPP Dictionary of Philosophy and Psychology, ed. J. M. Baldwin.

Economic Papers Related to the Cambridge Scientific Club, 1871-74²

- 1871a. "[Letter to Melusina Fay Peirce]," in Brent (1998, p. 89).
1871b. "Letter to Simon Newcomb," in Baumol and Goldfeld (1968), pp. 186-87.
1871c. "[Letter to Benjamin Peirce]," NEM, pp. 553-554.
1871d. "Calculus of Wealth," NEM, pp. 551-552 .
1873a. "Letter, Peirce to Abraham B. Conger," WP 3, pp. 109-10.
1874a. "[On Political Economy]," WP 3, pp. 173-76.

- 1873b. On the Theory of Errors of Observation, WP 3, pp. 114-160.

Popular Science Monthly Series, 1877-78 "Illustrations of the Logic of Science"

Six papers published in the Popular Science Monthly in 1877 and 1878 and reprinted in WP 3, pp. 242-338 and EP 1, pp. 109-199.

- 1877f. "The Fixation of Belief," WP 3, pp. 242-257.
1878a. "How to Make Our Ideas Clear," WP 3, pp. 257-276.
1878b. "The Doctrine of Chances," WP 3, pp. 276-289.
1878c. "The Probability of Induction," WP 3, pp. 290-305.
1878d. "The Order of Nature," WP 3, pp. 306-322.
1878e. "Deduction, Induction, and Hypothesis," WP 3, pp. 323-338.

- 1879a. "Note on the Theory of the Economy of Research," United States Coast Survey for the fiscal year ending June 1876, U.S. Government Printing Office 1879, reprinted in Operations Research, Vol. XV, 1967 [1879], pp. 642-648. Also reprinted in CP 7, pp. 76-83; and in WP 4, pp. 72-78.

¹Some minor variations from exact chronological order may be found due to closely related writings being grouped between pairs of horizontal double lines.

²A variation of chronological order occurs after the following group of writings.

The Johns Hopkins Writings on Scientific Method, 1880-1885³

- 1880a. “[On the State of Science in America],” WP 4, pp. 152-156.
 1881a. “Jevons’s Studies in Deductive Logic,” WP 4, pp. 238-239.
 1882a. “Introductory Lecture on the Study of Logic,” first published in Johns Hopkins University Circulars, 2: 19, November, pp. 11-12 in WP 4, pp. 378-382.
 1883a. Studies in Logic by Members of the Johns Hopkins University, editor, WP 4, pp. 406-450, CP 2, pp. 313-326, 433-477.
 1883b. “A Theory of Probable Inference,” in Studies in Logic 1883a, WP 4, pp. Pp. 408-453.
 1883-84a. “[Design and Chance],” WP 4, pp. 544-554 and EP 1, pp. 215-224, dated December of 1883-January 1884.
 1883-84b. “Study of Great Men,” WP 5, pp. 26-104, CP 7, pp. 165-174.
 1885a. (with Joseph Jastrow), “On Small Differences of Sensation,” WP 5, pp. 122-135.

Three Writings with Economic Themes, 1884-1885

- 1884e. “The Reciprocity Treaty with Spain,” WP 5, pp. 144-146.
 1885c. “The Spanish Treaty Once More,” WP 5, pp. 147-148.
 1885d. “[Testimony on the Organization of the Coast Survey],” given January 24, 1885, Miscellaneous Documents of the Senate of the U. S. 82, 1886, WP 5, pp. 149-161.

[One, Two, Three], Summer 1886

Drafts of chapters of proposed book titled [One, Two, Three] from the summer of 1886. These are the same ideas more fully developed in “A Guess at the Riddle.” (1887-1888).

- 1886a. “One, Two, Three: Kantian Categories,” WP 5, pp. 292-294.
 1886b. “One, Two, Three,” WP 5, pp. 294-298.
 1886c. “One, Two, Three: An Evolutionist Speculation,” WP 5, pp. 298-302.
 1886d. “[First, Second, Third],” WP 5, pp. 302-308.

The Peirce-Gurney Dispute over Phantasms of the Living, 1887 and 1889

Two critiques by Peirce and two responses from Gurney (1887, 1889), Proceedings of the American Society for Psychical Research, 1887 and 1889.

- 1887c. “Criticism on Phantasms of the Living: An Examination of an Argument of Messrs. Gurney, Myers, and Podmore,” WP 6, pp. 74-81.
 1887d. “Mr. Peirce’s Rejoinder,” WP 6, pp. 101-141
 1887e. “[Science and Immortality],” WP 6, pp. 61-64.

³A variation of chronological order occurs due to following group of writings.

A Guess at the Riddle Winter, 1887-88

Drafts of a proposed book, "A Guess at the Riddle," and a similar manuscript from 1888.

- 1887-88a. A Guess at the Riddle, in WP 6, pp. 168-210, EP 1, pp. 245-279, CP 1, pp. 181-226.
 1887-88b. "[Contents]," WP 6, pp. 166-167.
 1887-88c. "Chapter I: Trichotomy," WP 6, pp. 168-180.
 1887-88d. "[Chapter III]: The Triad in Metaphysics," WP 6, p. 181.
 1887-88e. "Chapter IV: The Triad in Psychology," WP 6, pp. 182-187.
 1887-88f. "Chapter V: The Triad in Physiology," WP 6, pp. 188-198.
 1887-88g. "Chapter VI: The Triad in Biological Development," WP 6, pp. 199-202.
 1887-88h. "Chapter VII: The Triad in Physics," WP 6, pp. 203-210.
 1887-88i. A Guess at the Riddle, in CP 1, pp. 181-226.
 1888a. "[Trichotomic]," WP 6, pp. 211-216.
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The Monist Metaphysical Series, 1891-93⁴

Five papers and a reply published in The Monist 1891 to 1893 and reprinted in EP 1, pp. 285-371.

1891. "The Architecture of Theories," in EP 1, pp. 285-297
 1892a. "The Doctrine of Necessity Examined," in EP 1, pp. 298-311
 1892b. "The Law of Mind," in EP 1, pp. 312-333 and CP 6, pp. 86-113.
 1892c. "Man's Glassy Essence," in EP 1, pp. 334-351
 1893b. "Evolutionary Love," in EP 1, pp. 352-371 and CP 6, pp. 190-215.
 1893c. "Reply to the Necessitarians: Rejoinder to Dr. Carus," The Monist, vol. 3, July, pp. 526-570, also CP 6, pp. 390-435.
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The Open Court Series, 1892-93⁵

Six essays published in The Open Court in 1892 and 1893.

- 1892d. "Pythagorics," The Open Court, vol. 6 (September 8), pp. 3375-3377 also HP 1, pp. 557-562.
 1892e. "The Critic of Arguments. I. Exact Thinking," The Open Court, vol. 6 (September 22), pp. 3391-3394 also CP 3, pp. 250-257..
 1892f. "Dmesis," The Open Court, vol. 6, (September 29), pp. 3399-3402, reprinted in the Journal of Public Law, Vol. 7, Spring, pp. 30-36.
 1892g. "The Critic of Arguments. II. The Reader is Introduced to Relatives," The Open Court, vol. 6 (October 13), pp. 3415-3418), also CP 3, pp. 257-265.
 1893e. "The Marriage of Religion and Science," The Open Court, vol. 7 (February 16), pp.

⁴A variation of chronological order occurs due to following group of writings.

⁵A variation of chronological order occurs due to following group of writings.

3559-3560 also CP 6, pp. 302-304.

1893f. "What is Christian Faith?," The Open Court, vol. 7 July 27), pp. 3743-3745 also CP 6, pp. 305-309.

1892h. "Why Do We Punish Criminals?," WP 8, p. 341-344.

General References

- Barber, Wm. J. 1993. "Political Economy in the Flagship of Postgraduate Studies: The Johns Hopkins University," in Economists and Higher Learning in the Nineteenth Century, ed. W. J. Barber. New Brunswick, N. J.: Transaction Publishers, pp. 203-224.
- _____. 2005. "General Introduction: The Development of the National Economy, 1865-1900," in The Development of the National Economy: The United States from the Civil War through the 1890s, Vol. 1, ed. Wm. J. Barber. London: Pickering & Chatto, pp. vii-xvii.
- Bateman, Bradley W. 2008. "Reflections on the Secularization of American Economics," Journal of the History of Economic Thought, Vol. 30, March, pp. 1-20.
- Clarke, James Freeman. 1879. "Law and Design in Nature," The North American Review, vol. 128, issue 270, May, pp. 553-558.
- Coats, A. W. 1993. "The Education Revolution and the Professionalization of American Economics," in Economists and Higher Learning in the Nineteenth Century, ed. W. J. Barber. New Brunswick, N. J.: Transaction Publishers, pp. 340-375.
- Cook, Joseph. 1879. "Law and Design in Nature," The North American Review, vol. 128, issue 270, May, pp. 548-553.
- Cournot, Augustin. 1929 [1838]. Researches into the Mathematical Principles of the Theory of Wealth. Trans. N.T. Bacon. New York: Macmillan.
- Darwin, Charles. 1962[1859]. The Origin of Species. London: Penguin.
- Ely, Richard, T. 1884 [2005]. "The Past and the Present of Political Economy," Johns Hopkins University Studies in Historical and Political Science, second series, Baltimore, pp. 5-64, reprinted in The Development of the National Economy: The United States from the Civil War through the 1890s, ed. Wm. J. Barber. London: Pickering & Chatto, pp. 7-66.
- _____. 1886a. "Ethics and Economics," Science, vol. 7, No. 175, June 11, pp. 529-533.
- _____. 1886b. "Socialism in America," The North American Review, vol. 142, issue 355, June, pp. 142-156.
- _____. 1886c. "The Economic Discussion in Science," Science, Vol. 8, No. 178, July 2, pp. 3-6.
- _____. 1886d. "Report of the Organization of the American Economic Association," Publications of the American Economics Association, vol. 1, no. 1, March, Baltimore, reprinted in The Development of the National Economy: The United States from the Civil War through the 1890s, ed. Wm. J. Barber. London: Pickering & Chatto, pp. 114-130.
- _____. 1931[2002]. The Story of Economics in the United States, Warren J. Samuels, ed. Amsterdam: JAI: An Imprint of Elsevier Science.
- Fisher, Irving. 1909. "Obituary: Simon Newcomb," The Economic Journal, Vol. 19, Dec., pp.

- 641-644.
- Franklin, Fabian. 1885. "Newcomb's Political Economy," Reply to E. J. James, Science, Vol. 6, No. 4., Dec. 4, pp. 495-496.
- _____. 1885. "Newcomb's 'Political Economy'," Science, Vol. 6, No. 150, Dec. 18, p. 538.
- Hausman, C. R. 1974. "Eros and Agape in Creative Evolution: A Peircean Insight," Process Studies, Vol. 4, Spring, pp. 11-23.
- James, Edmund. J. 1885a. "Newcomb's Political Economy," Science, Vol. 6, Nov. 27, pp. 470-471.
- _____. 1885b. "Newcomb's 'Political Economy'," Reply to Newcomb and Franklin, Science, Vol. 6, No. 149, Dec. 11th, pp. 517-518.
- _____. 1886. "The State as an Economic Factor," Science, Vol. 7, No. 173, May 28, pp. 485-488 and 490-491.
- McCosh, James. 1879. "Law and Design in Nature," The North American Review, vol. 128, issue 270, May, pp. 543-548.
- Moyer, Albert E. 1992. A Scientist's Voice in American Culture: Simon Newcomb and the Rhetoric of Scientific Method. Berkeley: University of California Press.
- Newcomb, Simon. 1866. "Carey's Principles of Social Science," The North American Review, No. 103, Issue 213, October, pp. 573-580.
- _____. 1870. "The Let Alone Principle," The North American Review, Vol. 110, No. 226, January, pp. 1-33.
- _____. 1872. "Jevons's Theory of Political Economy," The North American Review, Vol. 114, Issue 235, April, pp. 435-440.
- _____. 1874. "Exact Science in America," The North American Review, vol. 119, issue 245, October, pp. 286-308.
- _____. 1875. "The Method and Province of Political Economy," The North American Review, Vol. 121, issue 249, pp. 241-270.
- _____. 1876. "Abstract Science in America," The North American Review, vol. 122, issue 250, January, pp. 88-124.
- _____. 1878. "An Advertisement for a New Religion," The North American Review, vol. 127, issue 263, July-August, pp. 44-61.
- _____. 1879a. "Law and Design in Nature," The North American Review, vol. 128, issue 270, May, pp. 537-543.
- _____. 1879b. "Evolution and Theology: A Rejoinder," The North American Review, vol. 128, issue 271, June, pp. 647-663.
- _____. 1879c. "The Standard of Value," The North American Review, vol. 129, issue 274, September, pp. 223-238.
- _____. 1879d. "The Religion of To-day," The North American Review, vol. 129, issue 277, December, pp. 552-569.
- _____. 1880a. "Principles of Taxation," The North American Review, vol. 131, issue 285, pp. 142-156.
- _____. 1880b. "The Organization of Labor I: The Organizer as Producer," The Princeton Review, Vol. 1, pp. 392-410.
- _____. 1880c. "The Organization of Labor II: The Interest of the Laborer in Production," The

- Princeton Review, Vol. 2, pp. 232-246.
- _____. 1884. "The Two Schools of Political Economy," Princeton Review, Vol. 14, November, pp. 291-301, reprinted in The Development of the National Economy: The United States from the Civil War through the 1890s, ed. Wm. J. Barber. London: Pickering & Chatto, pp. 69-79
- _____. 1885. "Newcomb's 'Political Economy'," Reply to E. J. James," Science, Vol. 6, No. 4., Dec. 4, p. 495.
- _____. 1886a [1966]. Principles of Political Economy. New York: A.M. Kelley.
- _____. 1886b. "Aspects of the Economic Discussion," Science, Vol. 7, No. 176, June 18, pp. 538-542.
- _____. 1886c. "Can Economists Agree Upon the Basis of Their Teachings?," Science, Vol. 8, No. 179, July 9, pp. 25-26.
- _____. 1890. "Soap-Bubbles of Socialism," The North American Review, vol. 150, issue 402, pp. 563-571.
- _____. 1891. "New School Political Economists," The Nation, Vol. 53, No. 1358, July 9, p. 27.
- _____. 1893. "The Problem of Economic Education," Quarterly Journal of Economics, Vol. 7, No. 4, July, pp. 375-399.
- _____. 1894. "[Untitled review of Ely's Introduction to Political Economy and Outlines of Political Economy]," Journal of Political Economy, Vol 3, No. 1, December, pp. 106-111.
- _____. 1903. The Reminiscences of an Astronomer. Boston: Houghton, Mifflin and Company.
- _____. 1905. "The Basis of Economics as an Exact Science," Science, New Series, Vol. 21, No. 534, March pp. 446-461.
- Porter, Noah. 1879. "Law and Design in Nature," The North American Review, vol. 128, issue 270, May, pp. 543- 548.
- Seligman, Edwin R. A. 1886. "Changes in the Tenets of Political Economy with Time," Science, Vol. 7, No. 168, April 23, pp. 375-382.
- Smith, Richard Mayo. 1886. "Methods of Investigation in Political Economy," Science, Vol. 8, No. 181, July 23, pp. 81-87.
- Taussig, F. W. 1886. "The State as an Economic Factor," Vol. 7, No. 173, May 28, pp. 488-490.
- Wible, J.R. 1994. "Charles Sanders Peirce's Economy of Research," Journal of Economic Methodology, Vol. 1, pp. 135-160.
- _____. 2005. "Macroeconomics, Pragmatism, and Cognitive Scarcity: Keynes Should Have Read C. S. Peirce on Probability and Evolutionary Complexity," in Economic Policy-making Under Uncertainty: The Role of Truth and Accountability in Policy Advice, eds. Peter Mooslechner, Helene Schubert, and Martin Schuerz of the Austrian National Bank. Edward Elgar, 2005, pp., 122-168.