The Essential PEIRCE

Selected Philosophical Writings

VOLUME 2 (1893–1913)

EDITED BY

the Peirce Edition Project

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Contents

CHRONOLOGY

1839 Born in Cambridge, Mass., to Benjamin and Sarah Hunt (Mills) Peirce, 10 Sept.
1859 Graduated (A.B.) from Harvard
1861 Appointed aid in Coast Survey, 1 July
1862 Married Harriet Melusina Fay, 16 Oct.
1863 Graduated *summa cum laude* (Sc.B.) in Chemistry from Lawrence Scientific School
1865 Delivered Harvard lectures on "The Logic of Science," spring
1866 Delivered Lowell Institute lectures on "The Logic of Science; or Induction and Hypothesis," 24 Oct.–1 Dec.
1867 Elected to American Academy of Arts and Sciences, 30 Jan.
1869 Wrote first of about 300 *Nation* reviews; last in 1908
Assistant at Harvard Observatory, Oct. '69–Dec. '72
Delivered Harvard lectures on "British Logicians," Dec.–Jan.
1870 Travelled to Europe on first assignment for Coast Survey, 18 June '70–7 Mar. '71
1872 Co-founded Cambridge Metaphysical Club, Jan.
Promoted to rank of Assistant in the Survey, 1 Dec.
1875 Travelled to Europe on second assignment for Coast Survey, Apr. '75–Aug. '76
1876 Separated from Melusina, Oct.
1877 Elected to National Academy of Sciences, 20 Apr.
Travelled to Europe on third assignment for Coast Survey, 13 Sept.–18 Nov.
1878 Published *Photometric Researches*, Aug.
1879–84 Lectured in logic at Johns Hopkins University
1880 Elected to London Mathematical Society, 11 Mar.
Travelled to Europe on fourth assignment for Coast Survey, Apr.–Aug.
Death of Peirce's father, Benjamin, Sr., 6 Oct.
1881 Elected to American Association for the Advancement of Science in Aug.
1883 Published *Studies in Logic*, spring
Divorced Melusina, 24 Apr.
Married Juliette Froissy (Pourtalais), 30 Apr.
Travelled to Europe on fifth and final assignment for Coast Survey, May–Sept.
1884 Served as head of U.S. Office of Weights and Measures, Oct. '84–22 Feb. '85
1885–91 Worked intensively on preparation of more than 5,000 definitions for *Century Dictionary* (published 1889–91)
1886 Settled with Juliette in New York City and began reports on his gravity field work.

1887 Moved to Milford, Penn., 28 Apr.
Death of Peirce's mother, Sarah Mills, 12 Oct.
1888 Appointed by President Cleveland to the U.S. Assay Commission, 1 Jan.
Purchased Arisbe, 2 miles north of Milford, 10 May
1891 Resigned from Coast and Geodetic Survey, 31 Dec.
1891–93 Published *Monist* Metaphysical Series
1892 Delivered Lowell lectures on "The History of Science," 28 Nov. '92–5 Jan. '93
1893 "Search for a Method" announced by Open Court; not completed
1894 "The Principles of Philosophy" (in 12 vols.) announced by Henry Holt Co.; not completed
"How to Reason" rejected by both Macmillan and Ginn & Co.
1895 "New Elements of Mathematics" rejected by Ginn & Co.
1896 Consulting chemical engineer (till '02), St. Lawrence Power Co.
1896–97 Reviews of Ernst Schröder's works on logic of relatives
1898 Delivered Cambridge lectures on "Reasoning and the Logic of Things,"10 Feb.–7 Mar.
"The History of Science" announced by Putnam's; not completed
Acknowledged by Wm. James as father of pragmatism in lecture to the Berkeley Philosophical Union in which James introduced "Pragmatism," 26 Aug.
1901 Contributed to *Dictionary of Philosophy and Psychology*
Presented "On the Logic of Research into Ancient History" to National Academy of Science, 12–14 Nov.
1902 Applied to Carnegie Institution for grant to propose "Memoirs on Minute Logic," rejected
1903 Delivered Harvard lectures on "Pragmatism," *26* Mar.–17 May
Delivered Lowell lectures on "Some Topics of Logic," 23 Nov.–17 Dec.
Began correspondence with Victoria Lady Welby
1905–06 Published three *Monist* papers on pragmatism (series incomplete)
1906 Presented paper on existential graphs to National Academy of Science, Apr.
Presented paper on phaneroscopy to National Academy of Science, Nov.
1907 Delivered three Harvard Philosophy Club lectures on "Logical Methodeutic," 8–13 Apr.
Wrote lengthy letter-article to the Editors of *The Nation* and *Atlantic Monthly* on pragmatism (especially MS 318)
1908 Wrote "A Neglected Argument for the Reality of God," for the *Hibbert Journal*, Oct.
1908–09 Published *Monist* series on "Amazing Mazes"
1909 Originated a matrix method for three-valued logic; recorded in his Logic Notebook (MS 339), 23 Feb.
1911 Wrote "A Sketch of Logical Critics" for volume to honor Lady Welby (not completed)
1914 Died at Arisbe, 19 Apr.

PREFACE

This collection of writings by Charles Sanders Peirce provides in a convenient format a selection from his seminal works; one that is sufficiently comprehensive to enable readers to form a relatively complete impression of the main doctrines of his system of philosophy and to study its development. The present volume covers a period of about twenty years, roughly the years Max Fisch called Peirce's *Monist* period—when many of Peirce's philosophical papers were written for Open Court's journal, *The Monist*. If volume size had not been a factor, we would have included other notable philosophical papers, including Peirce's 1900 paper written for *Cosmopolitan*, "Our Senses as Reasoning Machines"; his informative 1902 application to the Carnegie Institution for a grant to enable him to write thirty-six memoirs on logic in which he planned to set out his complete system of philosophy; a more complete representation of his 1898 Cambridge Conference Lectures and his 1903 Lowell Lectures; and the papers, published and unpublished, from the 1905–6 *Monist* series on pragmatism that employ the Existential Graphs in the proof of pragmatism. We believe there is a need for a special volume devoted to Peirce's graphical logic and to writings that are based on the Existential Graphs, and hope to assemble such a volume as a separate publication in the course of preparing the *Writings*. As it is, we have had to exclude many valuable writings, among them most of Peirce's technical papers on mathematics, logic, and science, as well as his many contributions to other disciplines. Given these limitations, readers should bear in mind that Peirce, more than any other classic American philosopher, related his thought to mathematical, logical, and scientific conceptions.* The main selections in this volume are arranged chronologically from 1893 to 1913, beginning with a short paper on synechism and ending with one of Peirce's many unfinished late attempts to record for posterity his final views on the intricacies of reasoning. An appendix follows with excerpts from letters to Victoria Lady Welby and to William James to help fill out the most mature form of Peirce's theory of signs.

The introduction printed in Volume 1 (EP1) provides a summary account of Peirce's philosophy and serves as the general introduction to the present volume. The introduction to Volume 2 deals more fully with some of the key issues that motivated Peirce's thought after 1893. Peirce was fifty-three years old when the first EP2 selection was written in 1893. He would live for another twenty-one years and, during that time, would produce his most fully

*Many of Peirce's most significant technical works are available elsewhere: his scientific writings in the annual reports of the U.S. Coast and Geodetic Survey and in the first six volumes of the *Writings of Charles S. Peirce;* his logical writings in volumes 2–4 of the *Collected Papers of Charles Sanders Peirce;* and his mathematical writings in the four volumes of Carolyn Eisele's *New Elements of Mathematics.*

developed theory of signs and many of his most subtle and refined metaphysical theories. It was also during these later years that his interest in pragmatism was rekindled and that, in an attempt to work out a proof of his pragmatism, he put into service his unique system of graphical logic (his Existential Graphs) alongside his categories and his theory of signs. Peirce's interest in the theory of reasoning, a life-long preoccupation, continued unabated throughout these years up to his final days when he seemed to see with exceptional clarity the tension between "safe" but impotent thinking and the creative potency of "unsafe" reasoning. The subject of reasoning along with the related subjects of pragmatism and signs make up the principal themes of the thirty-one papers (plus appendix) that constitute this volume, although to say that may obscure more than it reveals. A reminder from the foreword to EP1 bears repeating: to read Peirce without keeping in mind the growth of his thought is to miss one of its key features, its special vitality. Peirce's writings are signs of a great intellect *in the process* of working its way toward the truth.

Peirce's extant writings—many writings were lost during his itinerant years with the Coast and Geodetic Survey and on several occasions after his death—would fill a hundred volumes the size of this one. A selected edition of some fifty volumes would be necessary to get a comprehensive sense of his work in all of the areas to which he contributed, including mathematics, geodesy, logic, philosophy, lexicology, the natural sciences, history, and psychology. The most ambitious multi-volume edition, *Writings of Charles S. Peirce: A Chronological Edition*, is now underway at the Peirce Edition Project at Indiana University–Purdue University, Indianapolis (IUPUI); thirty volumes are projected (Indiana University Press, 1981–). The first multi-volume edition started to appear some sixty-five years ago when the first of eight volumes of the *Collected Papers* was published (Harvard University Press, 1931–58). Four other major English-language collections have appeared within the last twenty-five years. Peirce's *Contributions to THE NATION* was edited by Kenneth L. Ketner and James E. Cook, in four parts (Texas Tech Press, 1975–88) and his *New Elements of Mathematics*, in three volumes, edited by Carolyn Eisele (Mouton/Humanities Press, 1975–76). A microfiche edition, *Complete Published Works*, was prepared under the general editorship of Ketner and accompanied by a printed *Comprehensive Bibliography* (Johnson Associates, 1977; revised and enlarged, Philosophy Documentation Center, 1986). Carolyn Eisele brought out two volumes of *Historical Perspectives on Peirce's Logic of Science: A History of Science* (Mouton, 1985). Two important series of lectures by Peirce have recently appeared in print: *Reasoning and the Logic of Things: The Cambridge Conference Lectures of 1898*, Kenneth L. Ketner, editor (Harvard University Press, 1992); and *Pragmatism As a Principle and Method of Right Thinking: The 1903 Harvard Lectures on Pragmatism*, Patricia Ann Turrisi, editor (State University of New York Press, 1997). A number of significant translations have also appeared, and more are underway.

The present two-volume collection cannot replace the more comprehensive editions, but it provides an affordable and reliable text that covers the full

extent of Peirce's system of philosophy. Its thematic boundaries are more expansive than those of several other one- or two-volume collections, and it is arranged chronologically, in two parts, to preserve the developmental character of Peirce's thought. Of the thirty-one principal selections included in this volume, only six were published during Peirce's lifetime. Of the remaining twenty-five writings, all edited from manuscripts and typescripts, only a few have already appeared in print in the forms given to the texts for the present edition. Special attention has been taken to ensure the integrity of the edited texts, and even though the selections from the last part of EP1 and all of EP2 will be reedited for the critical edition in accordance with the demanding guidelines of the Modern Language Association, we are confident that the volume as a whole is reliable from a textual point of view.

Editorial Policies

The selections in the present collection are printed with a minimum of editorial intrusion in the reading text, although we have used italicized editorial brackets to identify physical problems such as missing or unreadable text, and have indicated, with superscript arabic numerals, where we have contributed annotations. These annotations provide information (including translations) that Peirce himself did not provide. The footnotes, identified by asterisks, daggers, and so on, are Peirce's own. In a few of these footnotes we have provided, in italic brackets, additional information—such as names, dates, page numbers, and references to EP1 or to the *Writings*.

Copy-texts were selected with the standards of the critical edition in mind; they usually represent the most mature surviving forms closest to Peirce's hand. For those few items that Peirce saw through to publication, his final manuscript or typescript is used when it has survived. In such cases, Peirce's identifiable revisions in the publication (and in any surviving proofs or offprints) are emended into the text; variations judged to be typesetting errors or editorial sophistications are rejected. Two of Peirce's five published pieces ("Pearson's *Grammar of Science*" and "What Pragmatism Is") have no surviving pre-publication forms, and are edited directly from the original published text.

In all selections, Peirce's own errors of content are corrected. Where Peirce's punctuation or lack of punctuation might introduce confusion into a sentence, we have emended the punctuation for the convenience of the reader. Ease of reading is more central to the concept of the *Essential Peirce* volumes than to the critical edition, so we have made a number of regularizations to further facilitate reader comprehension. These emendations, which distinguish this edition from the critically-edited *Writings*, can be grouped under three categories of intervention:

(1) For the *Essential Peirce* we have generally regularized Peirce's inconsistencies of spelling, and modernized both his spellings and his word compounds. British spellings, used inconsistently by Peirce (and occasionally imposed by journal editors), are usually americanized. We have retained his

nineteenth-century style of pairing dashes with commas and other punctuation, but we have expanded his abbreviated terms and symbols into finished text. Ordinal numbers and related forms (i.e., "2ndly") are spelled out except in mathematical formulas or contexts. The conjunction "and" replaces his ampersands, "manuscript" replaces "MS," and so on. His abbreviated citations of books, articles, and journals are spelled out; where these appear parenthetically in running text, the bibliographical details are moved to Peirce's accompanying footnote or to the selection's backmatter annotations. Where we have supplied or emended titles, it is noted in the selection's headnote.

(2) Peirce's inconsistent use of single and double quotation marks to identify terms and to offset quotations has been regularized to double quotation marks throughout. In the present volume, single quotation marks are reserved for quotations within quotations. Commas and periods after quoted words or passages are normalized to the American standard form by placement within the closing quotation marks; all other marks of punctuation are placed outside the quotation. Cosmetic changes, such as the italicization of book titles cited by Peirce and the indentation of opening paragraphs, are also silently regularized. Peirce sometimes lists items as a series of single-sentence paragraphs; in general, we have grouped the items of each series together into single paragraphs.

(3) A peculiarity of Peirce's writing is his employment of capital letters for rhetorical emphasis or, more frequently, for words being defined, for class terms used specifically in reference to their place in a classification, for terms denoting "Platonic forms," and for terms of special importance in the discussion at hand. In general, we retain Peirce's capitalizations in these cases, and raise some terms to capitals where he has been inconsistent or erratic; however, where Peirce's capitalization is irregular, and does not reveal any of the patterns identified above, we have regularized to lowercase. Peirce's rhetorical cues sometimes go beyond capitalization—he also occasionally used heavily-inked squared script letters (in contrast to his normal cursive script) to convey special meaning or emphasis. This practice is most evident in his spoken lectures, where he may have intended the heavy printing as a reminder to emphasize a spoken word, or perhaps to write a word or phrase on a chalkboard. We represent these terms or phrases in italics.

Ordinarily, for the present volume, these editing interventions are not listed, but in cases where an intervention seems especially significant or problematic it is noted and discussed in the volume's backmatter annotations. A fuller record of our editorial interventions is available in *The Companion to The Essential Peirce*, which may be accessed through the Peirce Project Home Page (http://www.iupui.edu/~peirce); the *Companion* includes supplementary texts and expanded editorial commentary by the editors, and is expected to undergo frequent modifications.

As indicated above, editorial brackets are used to indicate textual problems. Words appearing in italic brackets indicate that they have been supplied or reconstructed by the editors; word substitutions, as when we emend "that"

for "than" or "it" for "is" to correct Peirce's slips of the pen, are emended silently. Text recovered from Peirce's incomplete or accidental manuscript deletions also appears without brackets; authoritative revisions by Peirce in subsequent surviving forms of the text are also emended into the copy-text without brackets. As with other emendations to the copy-text, these cases are recorded in the *Companion*. Omitted sections of text within a selection are indicated by ellipsis points surrounded by editorial brackets to distinguish these excisions from Peirce's own uses of ellipses, which will appear unbracketed. Editorial ellipses are supplied only if we omit text internally; selections that are extracts from larger works are so identified in their headnotes and are not bounded by ellipses.

The headnotes, which appear in old-style type after the title of each item, serve several purposes. They identify each item as a published paper or an unpublished manuscript; provide information on its composition and publication; and characterize its contents, indicating its place in the overall development of Peirce's system of philosophy. Papers published during Peirce's lifetime are identified by a "P" followed by a number keyed to the bibliographic information provided in Kenneth L. Ketner's *Comprehensive Bibliography* (2nd rev. ed., Philosophy Documentation Center, 1986). Unpublished papers are identified by "MS" followed by the number assigned in Richard Robin's *Annotated Catalogue of the Papers of Charles S. Peirce* (University of Massachusetts Press, 1967) and his "The Peirce Papers: A Supplementary Catalogue" (*Transactions of the Charles S. Peirce Society* 7 [1971]: 35–37). Republication (or first publication) in the two major editions is indicated either by a "W" *(Writings of Charles S. Peirce)*, followed by volume and page numbers, or by "CP" *(Collected Papers of Charles Sanders Peirce)*, followed by volume and paragraph numbers. Republication in some other editions is also noted by the following abbreviations: HP (HPPLS in EP1) *(Historical Perspectives on Peirce's Logic of Science)*, NEM *(The New Elements of Mathematics)*, CN (Peirce's *Contributions to THE NATION*), RLT *(Reasoning and the Logic of Things)*, and HL (*The 1903 Harvard Lectures*, edited by Turrisi). These abbreviations are used extensively in the notes.

We do not provide a list of secondary studies since the number of such works has grown to enormous proportions and the increasing availability of comprehensive bibliographic databases has almost obviated the need for printed bibliographies. The most complete printed listings of secondary studies, through 1982, are in the *Comprehensive Bibliography* and in *The Relevance of Charles Peirce* (The Hegeler Institute, 1983).

Acknowledgments

This volume represents the conclusion of a project begun in 1991 by Nathan Houser and Christian Kloesel. They carried out their plan for a two-volume edition of Peirce's "essential" philosophical writings through the publication of *The Essential Peirce*, Vol. 1 (EP1) and a preliminary selection of

writings for EP2. That selection was made with advice from a number of Peirce scholars, including H. William Davenport, Carl R. Hausman, Christopher Hookway, Menno Hulswit, Kenneth L. Ketner, Don D. Roberts, Richard S. Robin, Thomas L. Short, and Shea Zellweger. With supporting grants from IUPUI's School of Liberal Arts, Houser and Kloesel had some selected manuscripts transcribed but were unable to carry out the textual work and editing needed to prepare the writings for publication and the research required for annotations. Early in 1997 the Peirce Edition Project agreed to finish the selection and to undertake the editing for EP2. This decision was taken because all of the writings included in EP2 will also be included in the critical edition, making the preparation of EP2 a reasonable preliminary for the critical edition, and also because it was much desired by Indiana University Press, which has been such a good friend and supporter of the Peirce Edition Project. All royalties for EP2 have been assigned to the Peirce Edition Project.

Among those who have made significant contributions to the preparation of EP2, we would especially like to acknowledge Beth Eccles, who worked in the first stage with Houser and Kloesel, and the second-stage collaborators who helped so much after the work was assumed by the Peirce Project: Leah Cummins, Mary A. Gallagher, Ginger Johnson, Adam Kovach, Matt Lamm, Brian C. McDonald, and Tracie Peterson. We are also grateful for advice and support from Arthur W. Burks and Albert Wertheim, and for assistance from Webb Dordick, Aleta Houser, and Steven Russell. We would like to thank the Prince Charitable Trusts for helping the Peirce Project establish a stronger base of external support. We also want to acknowledge the NEH for their support of the *Writings*, which indirectly but significantly contributed to this work. Deserving of special mention for their support in the preparation of this book are Don L. Cook for his editorial advice, and our colleagues at the Indiana University Press for their encouragement and cooperation; IUPUI's School of Liberal Arts and its Dean, John D. Barlow; and Chancellor Gerald Bepko and Vice Chancellor William B. Plater. We would like to thank Indiana University President Myles Brand for his advice and support. We are grateful to the Harvard University Department of Philosophy and the Houghton Library at Harvard University, the Morris Library at Southern Illinois University, the York University Library, and the Smithsonian Institution, for permission to publish Peirce manuscripts or letters from their holdings.

Indianapolis, 1998

INTRODUCTION

In April 1887 Peirce moved with his second wife, Juliette, from New York City to Milford, Pennsylvania, a small resort town in the upper Poconos. A year and a half later the Peirces moved into a farmhouse two miles northeast of Milford in the direction of Port Jervis, New York. This was to become Peirce's Arisbe, named for a Greek town south of the Hellespont, a colony of Miletus, home of the first philosophers of Greece.[1] The renovation and expansion of the Arisbe house would often preoccupy Peirce during his remaining years. The architectural work of remodeling Arisbe, always with an eye for something vast, would become a living metaphor for his intellectual life.[2]

Starting in the mid-80s with his "Guess at the Riddle," Peirce began to gather his philosophical doctrines together into an integrated system of thought, and with his 1891 *Monist* article, "Architecture of Theories," he began to attend explicitly to the structural integrity of his system as a whole. One of Peirce's main efforts after 1890 was to reestablish pragmatism, not attended to since his 1877–78 "Illustrations," as an integral component of his systematic philosophy. The integrating structure for his mature philosophy would be a much expanded, though never fully completed, theory of signs. Also prominent in Peirce's later writings is a more dominating form of naturalism that ties the development of human reason unambiguously to natural evolution and that takes on clear religious overtones.

The introduction printed in volume 1 (EP1) is the general introduction for *The Essential Peirce* as a whole, but no attempt was made to represent Peirce's intellectual development during his last two decades. This special introduction to volume 2 (EP2) is intended to supplement the general introduction by providing a sketch of this period. Peirce's life continues to resist easy characterization—unless cryptically in the claim that he embodied the general maxim he extolled in his fourth Harvard Lecture (sel. 13): "Never say die." There is no doubt that his life was one of much suffering and many defeats, but he never for long lost sight of his purpose: to do what he could to advance human understanding. He knew his own powers, and he knew the mundane truth that knowledge is advanced through scholarly preparedness, insight, humility, and hard intellectual work; and it was no delusion of grandeur for him to realize that he was poised to make contributions no one else could make. The story of Peirce's struggle to redeem his talents is one of the great personal tragedies of

1. See Max H. Fisch, *Peirce, Semeiotic, and Pragmatism*, K. L. Ketner and C. J. W. Kloesel, eds. (Indiana University Press, 1986), pp. 227–48.

2. Murray G. Murphey, *The Development of Peirce's Philosophy* (Harvard University Press, 1961; Indianapolis: Hackett Publishing Co., 1993), p. 3.

our time, but it cannot be told here.[3] These remarks are intended only to provide a unifying structure for the writings in this collection and a vantage point for surveying the grand expanse of a remarkably rich and complicated mind.

One obstacle to a comprehensive understanding of Peirce's thought is the broad range of his intellectual achievements, covering so many of the human and physical sciences; but added to that is the difficulty of determining to what extent he was influenced by his predecessors and peers. Of course, no one can think in a vacuum—thought must necessarily relate to past thought, just as it must appeal to subsequent thought—so it is never cogent to ask about any thinker whether his or her thought was influenced by previous thinkers, but only how and to what extent. To Peirce, this was obvious. Given his upbringing among mathematicians and experimental scientists he learned early that intellectual progress is always relative to knowledge already gained and that any successful science must be a cooperative endeavor. One of the reasons Peirce is so important for the history of ideas is that he approached philosophy in this way, knowing that if philosophy was ever really to amount to anything it would have to abandon the notion that great ideas arise ex nihilo—that one's ideas are wholly one's own. As a result of this understanding, and of his desire to help move philosophy toward a more mature stage of development, Peirce became a diligent student of the history of ideas and sought to connect his thought with the intellectual currents of the past. He also studied carefully the leading ideas of his own time. His debts are extensive—far too numerous to be cataloged fully here—but it could not be too far wrong to say that Aristotle and Kant were his most influential predecessors, with Plato, Scotus, and perhaps Berkeley coming next, although only on the heels of many others such as Leibniz, Hegel, and Comte. With respect to Peirce's scientific, mathematical, or logical ideas, others have to be added, including, certainly, De Morgan and Boole. When one considers how Peirce's thought was influenced by the ideas of his contemporaries one is hard-pressed to settle on a short list. Peirce was very current in many fields of study, due both to his scientifically informed approach and to the fact that he wrote hundreds of book reviews and newspaper reports on scientific meetings and "picked up" ideas along the way. In logic and mathematics, and even in philosophy, aside from predecessors, the influence of Cayley, Sylvester, Schröder, Kempe, Klein, and especially Cantor stands out. Peirce was also responsive to the writings of his fellow-pragmatists, among whom he included Josiah Royce; but he was more influenced by William James than by any other contemporary. Other contemporaries of note were the philosopher and editor, Paul Carus, and the English semiotician, Victoria Lady Welby, whose work on signs ("significs") led her to Peirce, and whose attentive interest in his semiotic ideas encouraged him to develop his theory of signs more fully than he would have without her.

3. Peirce's life was long neglected and is still obscure. The best accounts can be found in: Fisch, *Peirce, Semeiotic, and Pragmatism;* Joseph Brent, *Charles Sanders Peirce: A Life* (Indiana University Press, 1993; revised ed. 1998); and Kenneth Laine Ketner, *His Glassy Essence: An Autobiography of Charles Sanders Peirce* (Vanderbilt University Press, 1998).

Paul Carus (1852–1919) is a special case. Carus, a student of Hermann Grassmann, has been surprisingly neglected by historians, given his remarkable output as a philosopher and his importance as an editor and critic. He wrote scores of books and hundreds of articles (not only on philosophy) and edited over one hundred issues of the *Monist* and over seven hundred issues of the *Open Court*, the two periodical publications of the Open Court Publishing Company.[4] Open Court authors included the classic American quartet, Peirce, James, Royce, and Dewey, and a host of others ranging from Ernst Mach and Bertrand Russell to D. T. Suzuki. Carus was a confirmed monist, as is revealed in the name of his journal, and devoted to the reconciliation of science and religion. He took a special interest in Peirce and for over twenty years, notwithstanding some periods of acrimony, he did more to promote Peirce's philosophy than anyone. Beginning in 1891, Carus published nineteen of Peirce's articles (thirteen in *The Monist* and six in *The Open Court*) and many of Peirce's unpublished writings were intended for Carus. The important role played by Carus in Peirce's later life, in particular the fact that after 1890 Peirce wrote most of his best work for the *Monist*, is what led Max Fisch to call that time Peirce's *Monist* period.

The writings in the present volume begin in 1893 when Peirce was fifty-three years old, only three years into the *Monist* period and one year after his forced resignation from the Coast and Geodetic Survey. He had recently delivered a course of lectures on "The History of Science" at the Lowell Institute in Cambridge and was just bringing to a close—one article prematurely—his influential metaphysical series for the *Monist* (EP1, sels. 21–25). He was at work on "Search for a Method," which was to include a substantially revised version of his 1877–78 "Illustrations of the Logic of Science" (EP1, sels. 7–12), and was about to announce a twelve-volume opus, *The Principles of Philosophy*, possibly inspired by James's recent success with his *Principles of Psychology*. Clearly, the opening writings of the present volume arose in the context of an active and ongoing program of research.

For an intellectual profile of EP2, the separate headnotes to the selections might be read consecutively. Although they were not composed to provide a continuous flow of text, they do give an idea of a thread of intellectual development that ties together the writings in this volume. Obviously it is not possible to capture rich full texts, as most of Peirce's are, in short notes, but sometimes a single strand of connected meaning is all that is needed to precipitate more substantial linkings. Building on the headnotes, bearing in mind some of the biographical structures developed in the general introduction in EP1, and also some of the more significant intellectual events of this later period, the following sketch emerges as one way to trace Peirce's development.

In the first selection, "Immortality in the Light of Synechism," written in 1893, Peirce gave an indication of the significance of the argument for continuity

4. Harold Henderson, *Catalyst for Controversy: Paul Carus of Open Court*, (Southern Illinois University Press, 1993). The Open Court Publishing Company was owned by the Chicago industrialist Edward C. Hegeler.

that he had planned for a conclusion to his *Monist* metaphysical series. "I carry the doctrine so far as to maintain that continuity governs the whole domain of experience in every element of it. Accordingly, every proposition, except so far as it relates to an unattainable limit of experience (which I call the Absolute), is to be taken with an indefinite qualification; for a proposition which has no relation whatever to experience is devoid of all meaning." Synechism would guide Peirce's philosophical investigations for the rest of his life. Peirce also signaled his growing conviction that science and religion were closely allied at some deep level.

The following year, in "What is a Sign?" (sel. 2), Peirce explored the relationship between logic and semiotics—even equating reasoning with semiosis. "What is a Sign" is taken from Peirce's unpublished book "How to Reason," also known as "Grand Logic." Elsewhere in that work, Peirce revived the nominalism-realism issue, which he had not dealt with since 1871, and he identified himself, for the first time, as an "extreme" realist.[5] Another year later, in "Of Reasoning in General" (sel. 3), he further developed his semiotic theory of logic elaborating more fully his theory that propositions must always involve two signs, one iconic and the other indexical. These ideas, along with the idea that our success in discovering natural laws is explained by our affinity with nature, would reemerge as key conceptions in Peirce's struggle to rework pragmatism and to account for non-rational human insight. But for a time, he would submerge himself in writing a mathematical textbook called "New Elements of Mathematics,"[6] and also in formal logic, particularly in some elaborate reviews of the recently published volumes of Ernst Schröder's *Vorlesungen über die Algebra der Logik*.[7]

Near the end of 1896 Peirce took what Max Fisch calls his "most decisive single step" in his progress toward an all-encompassing realism: he accepted "the possible" as a "positive universe" and rejected the nominalist view that the possible is merely what we do not know not to be true.[8] Peirce reported this change of mind in January 1897 in his second Schröder review (CP 3.527) and on 18 March wrote to James that he had "reached this truth by studying the question of possible grades of multitude, where I found myself arrested until I could form a whole logic of possibility" (CP 8.308). With his acceptance of real possibilities—which put Peirce in the Aristotelian wing of the realist camp—Peirce had become what Fisch called "a three-category realist," no longer regarding the potential as what the actual makes it to be, and now distinguishing the generality of firsts from the generality of thirds.

Peirce's embrace of what he would come to call "would-be's" marks a watershed that might be said to separate his middle years from the final period of his intellectual life. This change, in conjunction with his attention to the importance

5. Fisch, *Peirce, Semeiotic, and Pragmatism*, p. 193

6. Peirce's book was completed but not published in his lifetime. See notes 2–4 to selection 22 (p. 537).

7. Peirce's reviews appeared in the *Nation* and the *Monist*; see P620 (CP 3.425–455), P627 (CN 2:132–33), and P637 (CP 3.456–552).

8. Fisch, *Peirce, Semeiotic, and Pragmatism*, p. 194.

of continuity, would motivate much of the content of his 1898 Cambridge Conferences Lectures. However, the two lectures from that set that are included in the present volume (sels. 4 and 5) were perhaps shaped more by another event: the 1897 appearance of William James's book, *The Will to Believe and Other Essays in Popular Philosophy.* James had dedicated that book "To my old friend, Charles Sanders Peirce, to whose philosophic comradeship in old times and to whose writings in more recent years I owe more incitement and help than I can express or repay." Peirce was touched, and on 13 March wrote a reflective letter to James expressing his appreciation ("it was a truly sweet thing, my dear William"), and pointing out some ways his thinking had been affected by his experience of "the world of misery" which had been disclosed to him. Although rating "higher than ever the individual deed as the only real meaning there is [in] the Concept," he had come to see "more sharply than ever that it is not the mere arbitrary force in the deed but the life it gives to the idea that is valuable." It is not to "mere action as brute exercise of strength" that we should look if we want to find purpose. Peirce praised James's opening essay, "The Will to Believe," especially for its style and lucidity, but he clearly had reservations. James introduced his essay as an illustration of the continuing concern at Harvard for "vital subjects": it is "a defence of our right to adopt a believing attitude in religious matters, in spite of the fact that our merely logical intellect may not have been coerced."[9] A key point is that "our non-intellectual nature" influences our convictions. "Our passional nature," James wrote, "not only lawfully may, but must, decide an option between propositions, whenever it is a genuine option that cannot by its nature be decided on intellectual grounds." It seems evident that in his Cambridge Conferences Lectures Peirce's great interest in the tensions between theory and practice, and his advocacy of "the will to learn" as a prerequisite to actually learning, were stimulated by James's "The Will to Believe." It is noteworthy that from at least that time on, the role of instinct, or sentiment, as a co-participant with reason in the acquisition of knowledge became a key concern for Peirce, and it would not be long until he came to regard ethics and esthetics as epistemically more fundamental than logic.

Less than six months after hearing Peirce's lectures in 1898, William James traveled to California to address (on 26 August) the Philosophical Union at Berkeley.[10] It was in that lecture, entitled "Philosophical Conceptions and Practical Results," that James publicly introduced the word "Pragmatism."[11] James told his auditors that he would have preferred the name "Practicalism" but that he had settled on "Pragmatism" because that was the name Peirce had used in the early 1870s when he first advocated for pragmatism before the

9. This and the quotations that follow in this paragraph are from the opening essay of William James, *The Will to Believe and Other Essays in Popular Philosophy* (Longmans Green, 1896; Harvard University Press, 1979).

10. For Fisch's full account see *Peirce, Semeiotic, and Pragmatism*, pp. 283 ff.

11. K. L. Ketner and H. Putnam speculate that James's new-found interest in pragmatism, as well as "Royce's drift toward Peirce's ideas," was a consequence of Peirce's 1898 Cambridge Lectures (RLT 36).

Cambridge Metaphysical Club.[12] James was by this time one of America's most respected intellectuals and his message fell on fertile ground; before long there were a host of pragmatists in the U.S. and abroad. James's acknowledgment of Peirce as the originator of pragmatism increased Peirce's prominence and opened for him an opportunity to bring his distinct views into the growing international debate.[13]

Peirce's second wave of interest in pragmatism is often thought to have started with James's California lecture, but it would be more accurate to say that it began in the early 1890s with the resumption of his research in logic and methodology for his "Critic of Arguments" series for the *Open Court*, and for his books, "Search for a Method" and "How to Reason." If anything, James's 1890 *Principles of Psychology*, especially the treatment of the role of inference in perception, probably had more to do with Peirce's return to pragmatism. But it was also about 1890 when Peirce accepted the reality of actuality, or secondness, and then saw clearly that the individual is to be distinguished from the general. It may have been the logical ramifications of that large step toward a more embracing realism, precipitated by his recognition in the mid-80s of the need for both icons and indices for meaningful reference, that led Peirce to begin to rethink the argument of his 1877–78 "Illustrations." Nevertheless, it surely was the increasing popularity of pragmatism that James had spawned in 1898 that led Peirce to resolve to produce a proof that would distinguish his version of pragmatism from popular versions and sanction his as the "scientific" one.

The nineteenth century, after his Cambridge Conferences Lectures, came to a bad ending for Peirce. Between periods of illness and failures to land employment Peirce must have learned more about misery.[14] But he continued to make intellectual progress. On 17 August 1899 he wrote to Carus that "the true nature of continuity . . . is now quite clear to me." Previously Peirce had been "dominated by Cantor's point of view" and had dismissed Kant's definition unjustly. Now he saw that it is best not to try "to build up a continuum from points as Cantor does."[15] He began the twentieth century thinking about great men of science. On 12 January 1901 he published "The Century's Great Men in Science" in the *New York Evening Post*, noting that "the glory of the nineteenth century has been its science" and asking what it was that has distinguished its great contributors.[16] "Their distinctive characteristic throughout the century, and more and more so in each succeeding generation, has been devotion to the pursuit of truth for truth's sake." He reflected on his own boyhood in

12. Peirce's key anti-foundational arguments had appeared earlier in his 1868 *Journal of Speculative Philosophy* series; EP1, selections 2–4.

13. According to Murray Murphey, James's lecture put Peirce "in an intolerable intellectual position." Peirce could not now disown pragmatism, but neither could he "embrace it without qualification." Peirce had to come forward with his distinct views (*The Development of Peirce's Philosophy*, pp. 358-59).

14. See Brent, *Charles Sanders Peirce: A Life*, ch. 4.

15. Quoted in Eisele's NEM 3:780.

16. This article, as reprinted in the *Annual Report of the Smithsonian Institution for Year Ending June 30, 1900* (Washington, D.C., 1901) is published in Philip P. Wiener, ed., *Charles S. Peirce: Selected Writings* (Dover, 1966), pp. 265–74. Quotations are taken from Wiener's book.

Cambridge and on the leaders of the "scientific generation of Darwin," most of whom had passed through his home: "The word *science* was one often in those men's mouths, and I am quite sure they did not mean by it 'systematized knowledge,' as former ages had defined it, nor anything set down in a book, but, on the contrary, a mode of life; not knowledge, but the devoted, well-considered life-pursuit of knowledge; devotion to Truth—not 'devotion to truth as one sees it,' for that is no devotion to truth at all, but only to party—no, far from that, devotion to the truth that the man is not yet able to see but is striving to obtain." As Peirce's career opportunities dried up he came more and more to regard science and philosophy as devout pursuits.

Fortunately for Peirce, near the end of 1900 James Mark Baldwin hired him to finish the logic definitions after "J" for his *Dictionary of Philosophy and Psychology*. This work occupied much of Peirce's time in 1901, yet he managed to publish about twenty book reviews and to translate seven articles for the Smithsonian. One of the books Peirce reviewed in 1901 was Karl Pearson's *Grammar of Science* (sel. 6). An idea Peirce had put forward in his Cambridge Conferences Lectures, that it is illogical to make one's personal well-being "a matter of overwhelming moment," can be seen to be at work in this review. Peirce objected to Pearson's claim that human conduct should be regulated by Darwinian theory and that social stability is the sole justification of scientific research. The human affinity with nature that Peirce had earlier appealed to to explain our success in discovering natural laws (sel. 3), was here explained as resulting from the fact that the human intellect is an outgrowth of the rationality inherent in nature. This was a further rejection of nominalism, which holds that the rationality in nature arises in human reason. Peirce also rejected Pearson's claim that there are first impressions of sense that serve as the starting point for reasoning, and argues that reasoning begins in percepts, which are products of psychical operations involving three kinds of elements: qualities of feelings, reactions, and generalizing elements.

In 1901 in "Laws of Nature" (sel. 7), Peirce reviewed different conceptions of natural law and argued that the typical conception of scientists is that a law of nature is an objective fact—"much more reliable than any single observation." In remarking on the method scientists employ in their "exhumation" of laws of nature, he briefly described a method of conjecture and testing that he would develop in the following selection, "On the Logic of Drawing History from Ancient Documents." In selection 8, Peirce gave one of his most elaborate accounts of the different kinds of reasoning. He drew a distinction between two kinds of deductive reasoning, corollarial, which draws only those conclusions that can be derived from the analysis and manipulation of the premisses as given, and theorematic, which enriches the inference base by adding propositions which were not part of the original premiss set—and "which the *thesis* of the theorem does not contemplate" (p. 96). Peirce believed this distinction to be the most important division of deductions, and his most important discovery in the logic of mathematics.[17] He also introduced the crucial point he

17. Fisch, *Peirce, Semeiotic, and Pragmatism*, p. 334

would elaborate in his 1903 Harvard Lectures that "logical criticism cannot go behind *perceptual facts*"—the "first judgments which we make concerning percepts." Logic cannot criticize involuntary processes. Yet these "first judgments" do *represent* their percepts, although "in a very meager way."

By mid-1901 Peirce was ready to draw together the many interesting and diverse results he had been achieving into a major book project. The book was to be on logic, but in addition to reflecting his findings on continuity and modality, and his excitement with his progress on a graphical syntax for formal logic, he would incorporate his new discoveries in semiotics and reflect his growing belief that logic is a normative science. The book would be called "Minute Logic" to reflect the minute thoroughness with which he planned to examine every relevant problem. An early draft of the first chapter (MS 425) began with a section entitled "Logic's Promises" and the opening sentence: "Begin, if you will, by calling logic the theory of the conditions which determine reasonings to be secure." Within a year Peirce had drafted and redrafted hundreds of pages, and had finished four large chapters.[18] In July 1902 he prepared an elaborate application asking the Carnegie Institution, presided over by Daniel C. Gilman, to fund his "Logic" which he had reconceived as a set of thirty-six memoirs. His application ran to forty-five pages in typescript, and remains the best single guide to Peirce's system of thought.[19] Even though Peirce received strong recommendations from a powerful group of supporters, including the President, Theodore Roosevelt, and Andrew Carnegie himself, his project was not funded. On 19 June 1903 Peirce's brother, James Mills (Jem) wrote to William James: "Nobody who is familiar with the history of this affair can doubt that the refusal of the Committee is due to determined personal hostility on the part of certain members of the Committee." The matter had dragged on for so long, though, that by the time the rejection was definite, Peirce had already given his 1903 Harvard Lectures and was preparing for his Lowell Institute series—he would never return to his "Minute Logic." Jem wrote to James again on 23 June about the injustice of the Carnegie decision and thanked James for securing the Harvard Lectures for Charles: "I consider that the set of lectures given this Spring at Cambridge and the promise of the Lowell Lectures have saved him from going to ruin. For his fortunes were so desperate, that he could not much longer have resisted forces tending to destroy his bodily health and break down his mind."

The part of the "Minute Logic" included in EP2 is an excerpt from a chapter on the classification of the sciences. In "On Science and Natural Classes" (sel. 9), Peirce described a "natural class" as one "whose members are the sole offspring and vehicles of one idea," and he explained how ideas can "confer existence upon the individual members of the class"—not by bringing them

18. For an illustration of the logical depth of Peirce's work for this book, see the chapters by Glenn Clark and Shea Zellweger in *Studies in the Logic of Charles Sanders Peirce* (Indiana University Press, 1997).

19. Peirce's application to the Carnegie Institution (L 75) is available electronically on the Peirce-focused website: http://www.door.net/ARISBE/arisbe.htm.

into material existence, but by conferring on them "the power of working out results in this world." Such ideas, Peirce says, when not embodied have a "potential being, a being *in futuro*." This is Peirce's account of final causation, the power that ideas have "of finding or creating their vehicles, and having found them, of conferring upon them the ability to transform the face of the earth." Such is the power, Peirce believes, of the ideas of Truth and Right. It is in this context that he quotes the famous line from William Cullen Bryant, "Truth, crushed to earth, shall rise again."

In following out this thread of connecting ideas we come to what is probably the single most significant time in Peirce's mature life of ideas, his time in Cambridge in 1903 when he gave his famous "Harvard Lectures," just referred to above, followed not long after by his third series of Lowell Lectures. Peirce had paid close attention to the stream of writings on pragmatism that was gaining momentum and he thought the time had come for him to make a case for a more or less definitive core statement. But making his case or, as he saw it, proving his thesis, was a complicated matter requiring the marshaling of support from all areas of his vast system of thought. Further complicating matters was the fact that Peirce's system had gone through many changes since the 1870s. Among the more significant of those changes, some already mentioned above, was his acceptance of the reality of actuality (secondness) and later of possibility (firstness); his realization that human rationality is continuous with an immanent rationality in the natural cosmos; and his new-found conviction that logic is a normative science, epistemically dependent on ethics and esthetics. For Peirce, pragmatism had become a doctrine that conceptions are fundamentally relative to *aims* rather than to action per se as he had held in earlier years. To prove pragmatism, then, called for a basic rethinking within the context of a transformed, and still growing, philosophy. That was the task Peirce set out to perform in his 1903 Harvard and Lowell Lectures, and the program he inaugurated that year would guide him for the rest of his life.

In his Harvard Lectures, Peirce built his case for pragmatism on a new theory of perception, grounded in his theory of categories and on results from phenomenology, esthetics, and ethics (sel. 10). He argued that there is a realm of reality associated with each category and that the reality of thirdness is necessary to explain a mode of influence on external facts that cannot be explained by mechanical action alone (sel. 11). He argued that pragmatism is a logical, or semiotic, thesis concerning the meaning of a particular kind of symbol, the proposition, and explained that propositions are signs that must refer to their objects in two ways: indexically, by means of subjects, and iconically, by means of predicates (sel. 12). The crucial element of Peirce's argument, from the standpoint of his realism, involved the connection between propositional thought and perception. To preserve his realism, Peirce distinguished percepts, which are not propositional, from perceptual judgments, which are propositional, and which are, furthermore, the "first premisses" of all our reasonings. The process by which perceptual judgments arise from percepts became a key factor in Peirce's case (sel. 13). But *if* perceptual judgments are the starting

points for all intellectual development, then we must be able to perceive generality (sel. 14). Peirce next argued that abduction shades into perception, so that pragmatism may be regarded as the logic of abduction, and, finally, isolated three key points: that nothing is in the intellect that is not first in the senses; that perceptual judgments contain general elements; and that abductive inference shades into perceptual judgment without any sharp line of demarcation (sel. 15). Pragmatism, Peirce showed, follows from these propositions (sel. 16).

According to Fisch,[20] it was in the Harvard Lectures that Peirce, for the first time, made it clear that his realism was opposed to idealism as well as to nominalism. Peirce's new theory of perception embraced the doctrine of immediate perception, to deny which, according to Peirce, "cuts off all possibility of ever cognizing a *relation*." That idea was carried forward into the Lowell Lectures, where Peirce continued with his effort to prove pragmatism, making his best attempt so far, according to Fisch.[21] In "What Makes a Reasoning Sound" (sel. 17), the only lecture from the Lowell series that is included in EP2, Peirce made a strong case for objective grounds for evaluating reasonings and argued that with the right method even "a slight tendency to guess correctly" will assure progress toward the truth.

In conjunction with his Lowell Lectures, Peirce prepared a "Syllabus" to be distributed to his auditors. The first part is "An Outline Classification of the Sciences" (sel. 18), showing the normative sciences—esthetics, ethics, and logic—as constituting the central part of philosophy, and giving the order of epistemic and data-support relationships among the sciences that will guide his subsequent research. In "The Ethics of Terminology" (sel. 19), Peirce paused from his central task to elaborate on an issue that had been troubling him since he began working on logic entries in 1900 for Baldwin's *Dictionary* (and perhaps earlier with his work for the *Century Dictionary*): the unscientific terminology that prevailed in philosophy. Peirce recognized that philosophy could never abandon ordinary language altogether, for it is essential to understanding common conceptions, but philosophical analysis and progress calls for a specialized vocabulary. That was Peirce's strong conviction, and it explains his frequent resort to neologisms.

It may be that the attention Peirce gave to his classification of the sciences, along with his new-found conviction that logic is coextensive with semiotics, provided the impetus for the remaining two parts of the "Syllabus" that are included in EP2. They introduced a shift to an intensive development of his theory of signs along taxonomic lines motivated by his categories. In "Sundry Logical Conceptions" (sel. 20), Peirce introduced the semiotic trichotomy that divides signs according to whether they are interpreted as signs of possibility, fact, or law: rhemes (here called sumisigns), dicisigns, and arguments. That trichotomy was additional to his long-held division of signs according to whether they represent their objects by virtue of similarity, existential connection, or

20. Fisch, *Peirce, Semeiotic, and Pragmatism*, p. 195.
21. Fisch, *Peirce, Semeiotic, and Pragmatism*, p. 365.

law: icons, indices, or symbols. In "Nomenclature and Divisions of Triadic Relations" (sel. 21), Peirce introduced another trichotomy that distinguishes signs according to whether, in and of themselves, they are qualities, existents, or laws: qualisigns, sinsigns, and legisigns. With these three trichotomies in place, Peirce was able to identify ten distinct classes of signs. This was the beginning of a rapid development of his formal semiotic theory. There were two other parts of the "Syllabus" that are not included in EP2, one on Peirce's system of Existential Graphs, which Peirce would later choose as the preferred medium for the presentation of his proof of pragmatism, and the other an in-depth treatment of dyadic relations parallel to the treatment of triadic relations found in selection 21.

In the next two selections Peirce shifted his attention from pragmatism and its proof to concentrate more fully on the theory of signs. In "New Elements" (sel. 22), he focused on the abstract mathematical structures necessarily exhibited by sign relations and argued, as he had in "On Science and Natural Classes," that "representations have power to cause real facts" and that "there can be no reality which has not the life of a symbol." And in "Ideas, Stray or Stolen, about Scientific Writing" (sel. 23) Peirce gave one of his most focused accounts of speculative rhetoric, the third branch of his semiotic trivium, which has as its aim to find out "the general secret of rendering signs effective." Peirce made it clear that the range of legitimate semiotic effects (interpretants) includes feelings and physical results, as well as thoughts and other signs. Peirce reiterated a point he had made at least as early as his Harvard Lectures, that nothing can be represented unless it is of the nature of a sign, and he stressed that ideas can only be communicated through their physical effects.

While Peirce was writing about semiotics—and topics outside the scope of this volume (e.g., mathematics and graphical logic)—he had not stopped thinking about pragmatism. On 7 March 1904 he wrote to William James: "The humanistic element of pragmatism is very true and important and impressive; but I do not think that the doctrine can be *proved* in that way. The present generation likes to skip proofs. . . . You and Schiller carry pragmatism too far for me. I don't want to exaggerate it but keep it within the bounds to which the evidences of it are limited." By this time he was already at work on the first article of another series of papers for the *Monist* where he would again take up the proof of pragmatism.

Peirce's third *Monist* series opened with the April 1905 publication of "What Pragmatism Is" (sel. 24). This was to be the first of three papers that would explain in detail Peirce's special brand of pragmatism, give examples of its application, and prove it. Not long into his paper, Peirce paused to deliver a short lesson on philosophical nomenclature—the message being essentially the same as that of selection 19—as a rationale for renaming his form of pragmatism. He chose the name "pragmaticism" as one "ugly enough" to be safe from kidnappers. Peirce lamented that his word "pragmatism" was now met with in the literary journals, "where it gets abused in the merciless way that words have to expect when they fall into literary clutches." He would continue using his

new "ugly" word for the rest of the *Monist* series, and as late at 1909 (sel. 30, p. 457) he used "pragmaticism" because, he wrote, James and Schiller had made "pragmatism" imply "the will to believe, the mutability of truth, the soundness of Zeno's refutation of motion, and pluralism generally"; but he would often revert to his original name, indicating that he may not really have wanted to give it up.

After his excursus into philosophical terminology, Peirce examined the presuppositions of pragmaticism with his proof in mind. One key assumption was that all mental development (learning) takes place in the context of a mass of already formed conceptions, and another was that meaning is always virtual. He also argued for the relevance of all three of the categories of being for his pragmaticism: thought (thirdness) can only govern through action (secondness) which, in turn, cannot arise except in feeling (firstness).

The same year, in "Issues of Pragmaticism" (sel. 25), Peirce restated his pragmatic maxim in semiotic terms, along lines suggested in his sixth Harvard Lecture (sel. 15). He identified the meaning that pragmaticism seeks to enunciate as that of symbols rather than of simple conceptions. The thrust of this article was to articulate his forms of critical common-sensism and scholastic realism, which he regarded as consequences (or "issues") of pragmaticism. He extended his realism to include the acceptance of "real vagues" and "real possibilities," and he pointed out that "it is the reality of some possibilities that pragmaticism is most concerned to insist upon." According to Fisch, *pragmaticism* had now become *pragmatism* "purged of the nominalistic dross of its original exposition."[22]

There are a number of manuscript drafts for a third *Monist* article which indicate that Peirce intended to proceed with his proof along lines he would follow in selection 28. In one of those drafts, "The Basis of Pragmaticism in Phaneroscopy" (sel. 26), he began with an argument from the valency of concepts based in his phenomenology (phaneroscopy) and theory of categories. In another, "The Basis of Pragmaticism in the Normative Sciences" (sel. 27), he focused on the normative sciences, especially on his general theory of signs, as the key to the proof. Peirce pointed out that the pragmaticist will grant that the "*summum bonum*" consists in a "continual increase of the embodiment of the idea-potentiality" but insisted that without embodiment in something other than symbols, "the principles of logic show there never could be the least growth in idea-potentiality."

Around this time, Peirce was working intensely on the formal structure and systematic interconnections of semiotic relations. His logic notebook (MS 339) in 1905 and 1906 is rife with semiotic analyses and discoveries giving weight to the idea that it was in the context of his theory of signs that he expected to deliver his promised proof of pragmaticism. But when the third article of the series, "Prolegomena to an Apology for Pragmaticism," finally appeared in October 1906, it turned out to be an explication of his system of logical graphs, the Existential Graphs, instead of the expected proof. Peirce had decided that it

22. Fisch, *Peirce, Semeiotic, and Pragmatism*, p. 195.

was by means of the Existential Graphs that he could most convincingly set out his proof, which was to follow in subsequent articles (although it is significantly previewed in this one). Peirce had decided to use his system of graphs for his proof for three principal reasons: it employed the fewest possible arbitrary conventions for representing propositions, its syntax was iconic, and it facilitated the most complete analysis. Peirce worked for years on the continuation of this series, but he never finished it.

It is not known for certain why Peirce was unable to complete his Existential Graphs-based proof, but it is often supposed to have been a consequence of his failure to reach a satisfactory solution to the problem of continuity.[23] It is clear that Peirce expected his argument for pragmatism to also constitute a proof of synechism (see selection 24, p. 335). So it may have been technical problems involving the logic of continuity that kept Peirce from completing this series of papers. Peirce interrupted his efforts to complete this third *Monist* series with a separate series on "amazing mazes" (two articles of a proposed three were published in 1908–9) in which he developed applications of the Existential Graphs and worked out new definitions of continuity.[24] This mathematical line of thought led Peirce into a number of important technical questions involving probability and modality. By February 1909, Peirce had worked out a matrix method for an extension of the propositional calculus to three values—at least ten years before the similar work of Lukasiewicz and Post.[25] Peirce's acceptance of real possibility had convinced him that the definition of "probability" should include reference to dispositions in addition to frequencies, but even though he tried many alternatives involving the *propensity* view he was never satisfied that he had got it quite right.[26] For Peirce, this was a matter of considerable importance for pragmatism, because one of the great defects he found with his early theory was the nominalistic appeal to a frequency theory of probability. He also gave up the material interpretation of logical implication.[27]

Among the more entangled and confounding sets of manuscripts in the Harvard collection (the manuscripts acquired by the Harvard Philosophy Department after Peirce's death) is one from 1906–7 in which Peirce attempted to compose a more or less popular account of pragmaticism—but again called "pragmatism"—and to give at least a summary proof (MSS 316–22). Nominally, Peirce was composing a "letter to the editor," initially for the *Nation* but later for the *Atlantic*, although Peirce recognized it as a full-fledged article in his correspondence. In the two variants combined in selection 28, Peirce delivered a proof that is probably the one he was intending to give in the

23. See Fisch, *Peirce, Semeiotic, and Pragmatism*, p. 365 and Richard S. Robin, "Classical Pragmatism and Pragmatism's Proof" in *The Rule of Reason: The Philosophy of Charles Sanders Peirce*, Jacqueline Brunning and Paul Forster, eds. (University of Toronto Press, 1997), p. 149.

24. Fisch, *Peirce, Semeiotic, and Pragmatism*, p. 196.

25. See Fisch, "Peirce's Triadic Logic" (written with Atwell Turquette) in *Peirce, Semeiotic, and Pragmatism*, pp. 171–83, for details and for further remarks on triadic logic.

26. Fisch, *Peirce, Semeiotic, and Pragmatism*, p. 196.

27. According to Fisch (*Peirce, Semeiotic, and Pragmatism*, p. 196), material (Philonian) implication was Peirce's last nominalist stronghold.

Monist before he decided on a more formal approach using his Existential Graphs. The proof in selection 28 is based on Peirce's theory of signs, beginning with the premiss that every concept and every thought beyond immediate perception is a sign, and concluding with the proposition that a final logical interpretant must be of the nature of a habit. This selection provides an illuminating integration of Peirce's theory of signs, including his mature theories of propositions and inference, with his pragmaticism.

It is evident from the refinement of the theory of signs expressed in his remarkable "letter" that Peirce had not given up work on semiotics when he turned to his Existential Graphs for his *Monist* proof of pragmatism. There may have been a hiatus following his failure to get his "letter" into print, but by August 1908 he was hard at work on the classification of triadic relations (MS 339) and in December he resumed discussion of his theory of signs in correspondence with Lady Welby (sel. 32). Peirce's letters to Lady Welby record, often in summary form, the most advanced theory of signs ever fashioned. The theory as a whole is far too complex to be represented here, although it was lightly sketched in the general introduction in EP1, and a recent book by James Liszka provides an excellent introduction to the system in full.[28] For the thread of intellectual development being pursued here, it is noteworthy that early in 1906 Peirce wrote to Lady Welby that he had found it necessary to distinguish two semiotic objects (immediate and dynamical) and three interpretants (here called "intentional," "effectual," and "communicational"), and he introduced the important conception of the *commens*, which "consists of all that is, and must be, well understood between utterer and interpreter, at the outset, in order that the sign in question should fulfill its function." On 23 December 1908 Peirce defined "sign" as "anything which is so determined by something else, called its Object, and so determines an effect upon a person, which effect I call its Interpretant, that the latter is thereby mediately determined by the former." He immediately added that the only reason he had inserted "upon a person" into his definition was because he despaired of making his broader conception understood. Over the course of the next few days he laid out his "ten main trichotomies of signs" (eight of them had been quietly given in a single remarkable paragraph on pp. 402–3 of selection 28), the tenth one being the division that expresses the three sources of assurance utterances can have: instinct, experience, or form. This tenth trichotomy would occupy Peirce a great deal during his remaining five years. Peirce's correspondence with William James (sel. 33) repeats many of the same semiotic developments recorded in the letters to Lady Welby, but sometimes more perspicuously and always in a different voice. Modal considerations are more evident in the letters to James. As pointed out above, by 1909 Peirce had made deep advances into modal logic and this is reflected in various ways; for example, in Peirce's emphatic statement that the final interpretant consists in the way every mind "would act," not in the way any mind does act, and also in Peirce's division of semiotic objects into may-be's, actualities, and would-be's.

28. James Jakób Liszka, *A General Introduction to the Semeiotic of Charles Sanders Peirce* (Indiana University Press, 1996).

On 9 April 1908 Peirce received a letter from Cassius J. Keyser inviting him to write an article for the *Hibbert Journal*. Peirce replied (10 April), outlining ten alternative topics and asking Keyser to choose one. Peirce had written, as his third alternative: "as I believe the *Hibbert Journal* is favorable to theological discussion, I should willingly treat a little known 'proof' of the Being of God. Properly speaking it is not *itself* a proof, but is a statement of what I believe to be a fact, which fact, if true, shows that a reasonable man by duly weighing certain great truths will inevitably be led to believe in God."[29] Whether it was Keyser or Peirce who chose the third alternative is not clear, but Peirce spent most of the next three months composing "A Neglected Argument for the Reality of God" (sel. 29).

In that paper Peirce examined the attractive force of the idea of God and concluded that humans instinctively gravitate to it. He contended that belief in God is irresistible to anyone who naturally (through musement) comes to contemplate the possibility of God. The "God hypothesis" appears to be a special kind of abduction (he uses "retroduction" instead of "abduction" in this paper). It arises from a human power of guessing that is analogous to the instincts of animals, and because it recommends itself with unusual force we can take "a certain altogether peculiar confidence" in it as a sign of the truth. Peirce called this his "humble argument" but pointed out that it is not a "proof" because the process leading from the idea of God to belief in God is not a reasoned (self-controlled) development of ideas. Peirce was led to make a distinction between "argument" and "argumentation" that he had not explicitly made before: an *argument* is "any process of thought reasonably tending to produce a definite belief" while an *argumentation* is "an argument proceeding upon definitely formulated premisses." An argument, in other words, does not have to be self-controlled. The power of guessing was put forward as "a sort of divinatory power," what Galileo called *il lume naturale*, and appears to have supplanted Ockham's razor in Peirce's methodological arsenal.

As the conclusion of an "argumentation," the "God hypothesis" must pass through the three successive stages of inquiry: retroduction, deduction, and induction. Peirce devoted nearly half the paper to a discussion of these three stages, but ended up giving only the barest sketch of how they apply in this case. Scientific inquiry requires that any hypothesis be verified by putting its implications to the test of actual experience. The difficulty with the "God hypothesis" is that it is so vague—its object so "infinitely incomprehensible"—that it seems to be impossible to draw any definite implications from its supposed truth. This might appear to fall short of the demands of pragmatism, but, on closer look, one finds that after Peirce embraced the reality of possibility he reconceived the idea of "practical consequences." In his Harvard Lectures he had emphasized that the maxim of pragmatism reaches far beyond the *merely practical* and allows for any "flight of imagination," provided only that this imagination "ultimately alights upon a possible practical effect." The practical

29. Peirce to C. J. Keyser, 10 April 1908 (Rare Book and Manuscript Library, Columbia University).

effect that Peirce conceived the "God hypothesis" to "alight upon" is "the self-controlled growth of man's conduct of life." Some scholars wonder whether this weakens the pragmatic maxim beyond recovery—whether, in other words, this opens the way for reinstating into our ontologies all sorts of "beings" that Peirce's earlier pragmatism excluded—but that underscores the fundamental issue raised by this article: whether belief *can* have any value for the self-controlled growth of the conduct of life *if* its object is *not* real.

Peirce's probing of the logic of perception and his reflections on the effectiveness of religious belief, probably along with suggestions that arose from his taxonomic investigations in semiotics, led him in his last years to devote a great deal of thought to "the kinds and degrees of assurance that can be afforded by the different ways of reasoning." The related theory is what Peirce meant by "logical critics," the subject of his intended contribution for a book to honor Lady Welby. That paper, "A Sketch of Logical Critics" (sel. 30), is incomplete, but in the part he finished he made the important point that by "reasoning" we mean a "change in thought" that appeals to a relation between our new cognition (the "conclusion") and "an already existing cognition" (the premiss or premisses) to support our assent in the truth of the conclusion. But not all belief acquisition appeals, in any deliberate sense, to previous cognition, as we saw in the case of perceptual judgments and belief in God. Peirce's conclusion was that knowledge is acquired in two ways, by reasoning, of course, but also by experience. Belief acquired through reasoning must be justified by what preceded it in our minds, but belief gained through experience needs no justification.

In the final article in EP2, "An Essay Toward Reasoning in Security and in Uberty" (sel. 31), Peirce carried further his consideration of the benefits afforded by the different kinds of reasoning—although here again the discussion is left incomplete. This paper, written in October 1913, only a few months before his death, might suggest that he was having doubts about the value of pragmatism. But it would be more accurate to conclude that in his later years Peirce's thought gravitated to ideas and concerns that forced him—or *enabled* him—to see the limitations of pragmatism. In 1903 he had proclaimed Pragmatism to be "a wonderfully efficient instrument . . . of signal service in every branch of science" (sel. 10). He had recommended it as advantageous for the conduct of life. Now he saw that the appeal of pragmatism was its contribution to the security of reasoning—but there is a price to pay for security. According to Peirce, reasoning always involves a trade-off between security and uberty (rich suggestiveness; potency). Deductive reasoning provides the most security, but it is austere and almost entirely without evocative power. Abduction, on the other hand, is abundant in its uberty though nearly devoid of security. Peirce had come to see that pragmatism has the limitations that come with choosing security over uberty: "[it] does not bestow a single smile upon beauty, upon moral virtue, or upon abstract truth;—the three things that alone raise Humanity above Animality."

Naturalism had grown into a powerful force in Peirce's thought. He had come to believe that attunement to nature was the key to the advancement of

knowledge—as it was for life itself—and he thought that the power to guess nature's ways was one of the great wonders of the cosmos. Just as with animals, whose instinct enables them to "rise far above the general level of their intelligence" in performing their proper functions, so it is with humans, whose proper function, Peirce insisted, is to embody general ideas in art-creations, in utilities, and above all in theoretical cognition. But if attunement to nature is the key to the advancement of knowledge, it is at most a necessary condition; it puts thought on the scent of truth, which, to attain, must be won by skilled reasoning. Peirce remained a logician to the end.

This concludes the thread of development chosen here to draw together the separate papers in EP2, but it is only one of many approaches that could have been taken. Peirce's shift to a graphical syntax for his formal logic, with its corresponding emphasis on the importance of icons for reasoning, led to remarkable results in logic and in philosophy that parallels the course of development outlined above. Alternatively, the evolution of Peirce's theory of signs that is evident throughout EP2 might have been more systematically used to mark movements in Peirce's thought through these years. Or one might have expanded on Fisch's account of Peirce's ever-strengthening commitment to realism—or have followed the shifting influence of major thinkers and scientific discoveries on Peirce's thought. These and other approaches could be turned into useful heuristic guides to Peirce's intellectual life in his final two decades. But the growth of his pragmatism and, in particular, the development of its proof, surely represents a strong current running through the period and for much of it probably best represents Peirce's leading idea.

Something more should be said about Peirce's proof of pragmatism—one of the great puzzles for Peirce scholars. Max Fisch characterized it as "elusive" and Richard Robin says it is "unfinished business."[30] When he first claimed publicly in 1905 to have a proof (sel. 24), he said it was "a proof which seems to the writer to leave no reasonable doubt on the subject." Elsewhere he called it a "strict proof" or "scientific proof." We should not accept the pragmatic maxim, Peirce told the auditors of his second Harvard Lecture (sel. 11), "until it has passed through the fire of a drastic analysis." Peirce literally meant to "prove" pragmatism—but in the sense called for by philosophy. Philosophical proofs seek to prove *truths*, not just *theorems* (they strive to be *sound*, not just *valid*), and must therefore be concerned with establishing the truth of their premisses. Only rarely is the deductive form of a philosophical argument in dispute; the crucial questions almost always have to do with the legitimacy and strength of the premisses. And as with science generally, establishing the relevance and truth of contingent premisses calls for non-deductive forms of reasoning. As a result, proving pragmatism calls for marshaling an appropriate set of assumptions and supportable claims which, as premisses, will entail pragmatism as expressed in Peirce's maxim. In his first Harvard Lecture, to add to the "strictness" of the proof, Peirce deliberately expressed his maxim as a theorem:

30. Fisch, *Peirce, Semeiotic, and Pragmatism*, p. 363, and Robin, "Classical Pragmatism and Pragmatism's Proof," p. 149.

"Pragmatism is the principle that every theoretical judgment expressible in a sentence in the indicative mood is a confused form of thought whose only meaning, if it has any, lies in its tendency to enforce a corresponding practical maxim expressible as a conditional sentence having its apodosis in the imperative mood." So when Peirce claimed to have a proof of pragmatism, he meant that he could produce what he believed to be a convincing rationale, an argument (or, as he would say in his "Neglected Argument," an argumentation), to demonstrate that the pragmatic maxim, in a given form, strictly follows from a given set of premisses, and, furthermore, that each of the premisses is either a common assumption or can otherwise be shown to be admissible.

When Peirce's efforts to prove pragmatism are understood to be attempts to provide a convincing rationale or argument for the truth of his maxim, it makes sense to suppose that his first proof began to take shape in the early 1870s when he promoted pragmatism among the members of the Cambridge Metaphysical Club. His first published proof, then, would have been the argument of his "Illustrations." This is the view expressed by Max Fisch[31] and it is strongly supported by Peirce himself in his first Harvard Lecture (sel. 10): "The argument upon which I rested the maxim in my original paper was that belief consists mainly in being deliberately prepared to adopt the formula believed in as the guide to action." This belief, in turn, was carried back to "an original impulse to act consistently, to have a definite intention." But this is a "psychological principle" and by 1903 Peirce no longer thought it "satisfactory to reduce such fundamental things to psychology." Besides, as he wrote in the "additament" to his "Neglected Argument" (sel. 29), "I must confess the argument . . . might with some justice be said to beg the question." We might think of this early proof as the proof based on Peirce's theory of belief.

By 1903 Peirce had devoted a great deal of study to scientific proofs and to epistemic support relationships across sciences. By then he was much better prepared to build a proof of pragmatism, and it is clear that he was thinking of "proof" in a more rigorous sense. In his more technical restatement of his maxim for his Harvard Lectures, pragmatism was restricted to conceptions that can be expressed in sentential form. According to the pragmatic maxim, so stated, the meaning of a theoretical judgment expressible in a sentence in the indicative mood (what was originally expressed as "the object of our conception") lies in its tendency to enforce a corresponding practical maxim that takes the form of a conditional sentence (originally, "our conception of effects that might conceivably have practical bearings"). This is the thesis Peirce set out in 1903 to demonstrate. How did he go about it? Roughly by establishing, first, that all intellectual contents amount to theoretical judgments expressible in indicative sentences and, second, that all such judgments fundamentally appeal to imperative practical conditionals. To support the first part, he established: (1) nothing is in the intellect that was not first in the senses, (2) the process by which sensory stimulation rises to perceptual judgment is not subject to self-control, (3) perceptual judgments cannot be called into question and are the

31. Fisch, *Peirce, Semeiotic, and Pragmatism*, p. 363.

first premisses of all our reasonings, (4) perceptual judgments contain general (i.e. interpretative) elements (as in predicates of propositions), and (5) although literally particular, perceptual judgments entail general propositions. Then Peirce argued that (6) the process which results in perceptual judgments is a quasi-abductive process (depending on intellectual habits) which "interprets" percepts as cases falling under practical conditionals (and, therefore in relation to a purpose). This effectively proved his thesis. We might think of this as Peirce's proof of pragmatism based on his theory of perception.

In "Pragmatism" (sel. 28), Peirce shifted the burden of his proof to his theory of signs. He began by developing his thesis along lines he seemed to initially have had in mind for his *Monist* proof (see selection 26). First he characterized pragmatism as a method of ascertaining the meaning of "intellectual concepts" and he noted that "triadic predicates" are the principal examples (although, in passing, he considered whether there might be non-intellectual triadic relations). He noted that while signs can convey any of three forms of predicates (monadic, dyadic, or triadic), only triadic predicates are properly called "intellectual concepts." Only intellectual concepts convey more than feeling or existential fact, namely the "*would-acts*" of habitual behavior; and no agglomeration of actual happenings can ever completely fill up the meaning of a "would-be." This line of thought (with many steps left out) led Peirce to his thesis, what he called "the kernel of pragmatism" (p. 402): "The *total* meaning of the predication of an intellectual concept consists in affirming that, under all conceivable circumstances of a given kind, the subject of the predication would (or would not) behave in a certain way,—that is, that it either would, or would not, be true that under given experiential circumstances (or under a given proportion of them, taken *as they would occur* in experience) certain facts would exist." He also expressed his thesis in a simpler form: "The whole meaning of an intellectual predicate is that certain kinds of events would happen, once in so often, in the course of experience, under certain kinds of existential circumstances." This is what Peirce set out to prove in 1907.

Peirce's proof, much abbreviated, ran something like this:

1. "Every concept and every thought beyond immediate perception is a sign."
2. The object of a sign is necessarily unexpressed in the sign.
3. The interpretant is the "total proper effect of the sign" and this effect may be emotional, energetic, or logical, but it is the logical interpretant alone that constitutes "the intellectual apprehension of the meaning of a sign."
4. "A sign is anything, of whatsoever mode of being, which mediates between an object and an interpretant; since it is both determined by the object *relatively to the interpretant*, and determines the interpretant *in reference to the object*, in such wise as to cause the interpretant to be determined by the object through the mediation of this 'sign.'"
5. The logical interpretant does not correspond to any kind of object, but is essentially in a relatively future tense, what Peirce calls a "would-be." Thus the logical interpretant must be "general in its possibilities of reference."
6. Therefore, the logical interpretant is of the nature of habit.
7. A concept, proposition, or argument may be a logical interpretant, but not a final logical interpretant. The habit alone, though it may be a sign in some other way, does not call for further interpretation. It calls for action.

8. "The deliberately formed, self-analyzing habit . . . is the *living definition*, the veritable and final logical interpretant."
9. "*Consequently*, the most perfect account of a concept that words can convey will consist in a description of that habit which that concept is calculated to produce. But how otherwise can a habit be described than by a description of the kind of action to which it gives rise, with the specification of the conditions and of the motive?"

This conclusion is virtually a paraphrase of Peirce's thesis, the "kernel of pragmatism," so it completes his proof. We might think of this as the proof from Peirce's theory of signs. On 10 April 1907, Peirce sent Giovanni Papini a similar, though somewhat fuller, outline and explained that "among all scientific proofs with which I am acquainted [this is] the one that seems to me to come nearest to popular apprehension."[32]

When Peirce began his third *Monist* series, represented in EP2 in selections 24–27, he probably had something like the above proof in mind, although perhaps something more wide-ranging. The definition of pragmatism as set out in "What Pragmatism Is" (sel. 24) gives some idea of what he was aiming for: pragmatism, he wrote, is "the theory that a *conception*, that is, the rational purport of a word or other expression, lies exclusively in its conceivable bearing upon the conduct of life; so that, since obviously nothing that might not result from experiment can have any direct bearing upon conduct, if one can define accurately all the conceivable experimental phenomena which the affirmation or denial of a concept could imply, one will have therein a complete definition of the concept, and *there is absolutely nothing more in it*" (332). Peirce pointed out that to prove this thesis it would be necessary to appeal to a wide range of "preliminary propositions." Don D. Roberts has listed seventeen "premisses" that he thinks are likely to be among the ones Peirce had in mind, and these include "dismiss make-believes," "logical self-control is a mirror of ethical self-control," "an experiment is an operation of thought," "we do not doubt that we can exert a measure of self-control over our future actions," "a person is not absolutely individual," and "thinking is a kind of dialogue."[33]

Midway through his third *Monist* series, Peirce changed his mind and decided to base his proof on his Existential Graphs. He never completed his graph-based proof, but there are many manuscript pages indicating what he had in mind. In one draft (MS 298) Peirce explained: "You 'catch on,' I hope. I mean, you apprehend in what way the system of Existential Graphs is to furnish a test of the truth or falsity of Pragmaticism. Namely, a sufficient study of the Graphs should show what nature is truly common to all significations of concepts; whereupon a comparison will show whether that nature be or be not the very ilk that Pragmaticism (by the definition of it) avers that it is. . . ."

That proof, as represented in preliminary form in Peirce's 1906 "Prolegomena to an Apology for Pragmaticism" (CP 4.530–72) and in MSS 296–300, is extremely complex. It depends heavily on establishing that the system of

32. Peirce to G. Papini, 10 April 1907 (Papini Archives).

33. Don D. Roberts, "An Introduction to Peirce's Proof of Pragmatism," *Transactions of the Charles S. Peirce Society* 14 (1978), p. 128.

Existential Graphs provides a working model of thought and that experimenting with the Graphs amounts to experimenting with concepts themselves. The sweep of issues addressed in the premisses of this proof includes: that the proper objects for investigation in experiments with diagrams are *forms of relation*; that deductive reasoning is no more certain than inductive reasoning when experimentation can be "multiplied at will at no more cost than a summons before the imagination"; that icons have more to do with the living character of truth than either symbols or indices; that reasoning must be chiefly concerned with forms; that diagrams are icons of the forms of relations that constitute their objects; that members of a collection, taken singly, are not as numerous as the relations among them; that there can be no thought without signs and there are no isolated signs; that every logical evolution of thought should be dialogic; and that thought is not necessarily connected with a brain. This is only a sampling. There is little doubt that the full exposition of Peirce's Graphs-based proof would shed considerable light on the complex network of relationships internal to Peirce's system of thought that support pragmatism, but it is not so clear whether its upshot would be to prove pragmatism or to prove that the system of Existential Graphs is a valid normative logic of cognition—*really* a "moving picture of thought" as Peirce once said (CP 4.11).

Most of Peirce's arguments for pragmatism, and there are a number that have not been mentioned, seem to be quite straightforward in setting out what is to be proved—the pragmatic maxim as a carefully stated thesis—and in supplying the assumptions and premisses that entail that thesis as conclusion. The intractability of these arguments usually results from their large number of premisses, ranging over vast sweeps of Peirce's system of thought, and from the difficulty involved in establishing the premisses. But the matter is complicated by the fact that many of the involved premisses require inductive support, and by apparent promises of inductive confirmation for the pragmatic conclusion, which Peirce thought his readers might hesitate to accept because of the overall complexity of the argument and the novel ideas it involved.[34] An important question emerges: What kind of principle is the pragmatic maxim after all? Is it a logical maxim and a regulative principle, or is it a positive truth that can be treated as a scientific hypothesis calling for inductive confirmation? Peirce's treatment suggests that it is both. But as a positive truth informing us how to construe the meaning of conceptions or propositions—signs with intellectual value—how could the pragmatic maxim be confirmed? In criticizing the argument of his 1877–78 "Illustrations," Peirce disallowed any appeal to psychology, and in any case his classification of the sciences shows that the only positive sciences that can legitimately be appealed to are phenomenology and the prior normative sciences (and parts of logic) on which logical methods must rely. Peirce thought the maxim could be tested by *using* it to analyze familiar intellectual conceptions such as "real," "identity," "sequence," "substance," "time," and "probability," but *only* after he had established that his logical analyses of

34. See, for example, MS 300 and Roberts, "An Introduction to Peirce's Proof of Pragmatism," p. 129, for some elaboration.

those conceptions was neither psychological nor question-begging. That seems to be why he had first to prove that working with his Existential Graphs was "equivalent" to working with conceptions themselves. His proof from the Existential Graphs, then, appears to have been integral to his effort to prove pragmatism inductively. One of the limitations of this approach is that it can never wield demonstrative force, and the argument can always be carried further; but the hope must be that the time will come when further confirmation is beside the point. It is probably this inductive approach that has lent support to the view that Peirce's proof is rather amorphous and perhaps at best a cable with fibers of independent sub-arguments. Overall, it is easy to see why Thompson said that a "real proof" of pragmatism "would amount to a kind of elucidation of most of Peirce's philosophy and formal logic" and why Robin said that "coming to terms with pragmatism's proof" means coming to terms "with the whole Peirce."[35]

When Peirce died in the spring of 1914 he left a lot of important work unfinished. Perhaps most to be regretted is that he was unable to complete his "System of Logic, Considered as Semeiotic," which he hoped would stand for realism in the twentieth century as Mill's *System of Logic* had stood for nominalism in the nineteenth.[36] As it was, he did leave far more than has since been put to good use. More than fifty years ago, the great American social philosopher, Sidney Hook, wrote of Peirce that "he is just as much the philosopher's philosopher [today], just as much the pioneer of a second Copernican revolution in thought (one more genuine than Kant's) as he was when his meteoric genius first flashed across American skies."[37] It is still true that Peirce is mainly a "philosopher's philosopher." But it may turn out that his pioneering work, perhaps especially his later writings so tightly packed with ideas, will bloom at last into the influential legacy that Peirce in hopeful moments imagined would be his bequest to the future. Perhaps this collection, in spite of its limitations, will contribute to that end.

Nathan Houser

35. Manley Thompson, *The Pragmatic Philosophy of C. S. Peirce* (University of Chicago Press, 1953), p. 249. Robin, "Classical Pragmatism and Pragmatism's Proof," p. 150.

36. See MS 640 and NEM 3:875; and Fisch, *Peirce, Semeiotic, and Pragmatism*, p. 196. Many manuscripts from Peirce's last decade develop logic from the standpoint of semiotics but, perhaps, none more fully than MS 693.

37. Quoted from a tribute solicited by Frederic Harold Young and published by him in *Charles Sanders Peirce; America's Greatest Logician and Most Original Philosopher* (privately published, 1946), an address delivered in October 1945 to the Pike County Historical Society in Milford, Pennsylvania.

THE ESSENTIAL PEIRCE

Thoroughgoing synechism will not permit us to say that the sum of the angles of a triangle exactly equals two right angles, but only that it equals that quantity plus or minus some quantity which is excessively small for all the triangles we can measure. We must not accept the proposition that space has three dimensions as strictly accurate; but can only say that any movements of bodies out of the three dimensions are at most exceedingly minute. We must not say that phenomena are perfectly regular, but only that the degree of their regularity is very high indeed.

There is a famous saying of Parmenides, *ἔστι γὰρ εἶναι μηδὲν δ'οὐκ ἔστιν*, "being is, and not-being is nothing."[4] This sounds plausible; yet synechism flatly denies it, declaring that being is a matter of more or less, so as to merge insensibly into nothing. How this can be appears when we consider that to say that a thing *is* is to say that in the upshot of intellectual progress it will attain a permanent status in the realm of ideas. Now, as no experiential question can be answered with absolute certainty, so we never can have reason to think that any given idea will either become unshakably established or be forever exploded. But to say that neither of these two events will come to pass definitively is to say that the object has an imperfect and qualified existence. Surely, no reader will suppose that this principle is intended to apply only to some phenomena and not to others,—only, for instance, to the little province of matter and not to the rest of the great empire of ideas. Nor must it be understood only of phenomena to the exclusion of their underlying substrates. Synechism certainly has no concern with any incognizable; but it will not admit a sharp sundering of phenomena from substrates. That which underlies a phenomenon and determines it, thereby is, itself, in a measure, a phenomenon.

Synechism, even in its less stalwart forms, can never abide dualism, properly so called. It does not wish to exterminate the conception of twoness, nor can any of these philosophic cranks who preach crusades against this or that fundamental conception find the slightest comfort in this doctrine. But dualism in its broadest legitimate meaning as the philosophy which performs its analyses with an axe, leaving, as the ultimate elements, unrelated chunks of being, this is most hostile to synechism. In particular, the synechist will not admit that physical and psychical phenomena are entirely distinct,—whether as belonging to different categories of substance, or as entirely separate sides of one shield,—but will insist that all phenomena are of one character, though some are more mental and spontaneous, others more material and regular. Still, all alike present that mixture of freedom and constraint, which allows them to be, nay, makes them to be teleological, or purposive.

Nor must any synechist say, "I am altogether myself, and not at all you." If you embrace synechism, you must abjure this metaphysics of wickedness. In the first place, your neighbors are, in a measure, yourself, and in far greater measure than, without deep studies in psychology, you would believe. Really, the selfhood you like to attribute to yourself is, for the most part, the vulgarest delusion of vanity. In the second place, all men who resemble you and are in analogous circumstances are, in a measure, yourself, though not quite in the same way in which your neighbors are you.

There is still another direction in which the barbaric conception of personal identity must be broadened. A Brahmanical hymn begins as follows: "I am that pure and infinite Self, who am bliss, eternal, manifest, all-pervading, and who am the substrate of all that owns name and form."[5] This expresses more than humiliation,—the utter swallowing up of the poor individual self in the spirit of prayer. All communication from mind to mind is through continuity of being. A man is capable of having assigned to him a *rôle* in the drama of creation; and so far as he loses himself in that *rôle*,—no matter how humble it may be,—so far he identifies himself with its Author.

Synechism denies that there are any immeasurable differences between phenomena; and by the same token, there can be no immeasurable difference between waking and sleeping. When you sleep, you are not so largely asleep as you fancy that you be.

Synechism refuses to believe that when death comes, even the carnal consciousness ceases quickly. How it is to be, it is hard to say, in the all but entire lack of observational data. Here, as elsewhere, the synechistic oracle is enigmatic. Possibly, the suggestion of that powerful fiction *Dreams of the Dead*, recently published,[6] may be the truth.

But, further, synechism recognizes that the carnal consciousness is but a small part of the man. There is, in the second place, the social consciousness, by which a man's spirit is embodied in others, and which continues to live and breathe and have its being very much longer than superficial observers think. Our readers need not be told how superbly this is set forth in Freytag's *Lost Manuscript*.[7]

Nor is this, by any means, all. A man is capable of a spiritual consciousness, which constitutes him one of the eternal verities, which is embodied in the universe as a whole. This as an archetypal idea can never fail; and in the world to come is destined to a special spiritual embodiment.

A friend of mine, in consequence of a fever, totally lost his sense of hearing. He had been very fond of music before his calamity; and, strange to say, even afterwards would love to stand by the piano when a good performer played. "So then," I said to him, "after all you can hear a little." "Absolutely not at all," he replied; "but I can *feel* the music all over my body." "Why," I exclaimed, "how is it possible for a new sense to be developed in a few months!" "It is not a new sense," he answered. "Now that my hearing is gone I can recognize that I always possessed this mode of consciousness, which I formerly, with other people, mistook for hearing." In the same manner, when the carnal consciousness passes away in death, we shall at once perceive that we have had all along a lively spiritual consciousness which we have been confusing with something different.

I have said enough, I think, to show that, though synechism is not religion, but, on the contrary, is a purely scientific philosophy, yet should it become generally accepted, as I confidently anticipate, it may play a part in the onement of religion and science.

2

What Is a Sign?

MS 404. [Published in part in CP 2.281, 285, and 297–302. This work, probably composed early in 1894, was originally the first chapter of a book entitled "The Art of Reasoning," but was then turned into the second chapter of Peirce's multi-volume "How to Reason: A Critick of Arguments" (also known as "Grand Logic").] In this selection Peirce gives an account of signs based on an analysis of conscious experience from the standpoint of his three universal categories. He discusses the three principal kinds of signs—icons, indices, and symbols—and provides many examples. He maintains, as he had earlier, that reasoning must involve all three kinds of signs, and he claims that the art of reasoning is the art of marshalling signs, thus emphasizing the relationship between logic and semiotics.

§1. This is a most necessary question, since all reasoning is an interpretation of signs of some kind. But it is also a very difficult question, calling for deep reflection.[1]

It is necessary to recognize three different states of mind. First, imagine a person in a dreamy state. Let us suppose he is thinking of nothing but a red color. Not thinking about it, either, that is, not asking nor answering any questions about it, not even saying to himself that it pleases him, but just contemplating it, as his fancy brings it up. Perhaps, when he gets tired of the red, he will change it to some other color,—say a turquoise blue,—or a rose-color;—but if he does so, it will be in the play of fancy without any reason and without any compulsion. This is about as near as may be to a state of mind in which something is present, without compulsion and without reason; it is called *Feeling*. Except in a half-waking hour, nobody really is in a state of feeling, pure and simple. But whenever we are awake, something is present to the mind, and what is present, without reference to any compulsion or reason, is feeling.

Second, imagine our dreamer suddenly to hear a loud and prolonged steam whistle. At the instant it begins, he is startled. He instinctively tries to get away; his hands go to his ears. It is not so much that it is unpleasing, but it forces itself so upon him. The instinctive resistance is a necessary part of it: the man would not be sensible his will was borne down, if he had no self-assertion to be borne down. It is the same when we exert ourselves against outer resistance; except for that resistance we should not have anything upon which to exercise strength. This sense of acting and of being acted upon, which is our sense of the reality of things,—both of outward things and of ourselves,—

may be called the sense of Reaction. It does not reside in any one Feeling; it comes upon the breaking of one feeling by another feeling. It essentially involves two things acting upon one another.

Third, let us imagine that our now-awakened dreamer, unable to shut out the piercing sound, jumps up and seeks to make his escape by the door, which we will suppose had been blown to with a bang just as the whistle commenced. But the instant our man opens the door let us say the whistle ceases. Much relieved, he thinks he will return to his seat, and so shuts the door, again. No sooner, however, has he done so than the whistle recommences. He asks himself whether the shutting of the door had anything to do with it; and once more opens the mysterious portal. As he opens it, the sound ceases. He is now in a third state of mind: he is *Thinking*. That is, he is aware of learning, or of going through a process by which a phenomenon is found to be governed by a rule, or has a general knowable way of behaving. He finds that one action is the means, or middle, for bringing about another result. This third state of mind is entirely different from the other two. In the second there was only a sense of brute force; now there is a sense of government by a general rule. In Reaction only two things are involved; but in government there is a third thing which is a means to an end. The very word *means* signifies something which is in the middle between two others. Moreover, this third state of mind, or Thought, is a sense of learning, and learning is the means by which we pass from ignorance to knowledge. As the most rudimentary sense of Reaction involves two states of Feeling, so it will be found that the most rudimentary Thought involves three states of Feeling.

As we advance into the subject, these ideas, which seem hazy at our first glimpse of them, will come to stand out more and more distinctly; and their great importance will also force itself upon our minds.

§2. There are three kinds of interest we may take in a thing. First, we may have a primary interest in it for itself. Second, we may have a secondary interest in it, on account of its reactions with other things. Third, we may have a mediatory interest in it, in so far as it conveys to a mind an idea about a thing. In so far as it does this, it is a *sign*, or representation.

§3. There are three kinds of signs. Firstly, there are *likenesses*, or icons; which serve to convey ideas of the things they represent simply by imitating them. Secondly, there are *indications*, or indices; which show something about things, on account of their being physically connected with them. Such is a guidepost, which points down the road to be taken, or a relative pronoun, which is placed just after the name of the thing intended to be denoted, or a vocative exclamation, as "Hi! there," which acts upon the nerves of the person addressed and forces his attention. Thirdly, there are *symbols*, or general signs, which have become associated with their meanings by usage. Such are most words, and phrases, and speeches, and books, and libraries.

Let us consider the various uses of these three kinds of signs more closely.

§4. *Likenesses.* Photographs, especially instantaneous photographs, are very instructive, because we know that they are in certain respects exactly like

the objects they represent. But this resemblance is due to the photographs having been produced under such circumstances that they were physically forced to correspond point by point to nature. In that aspect, then, they belong to the second class of signs, those by physical connection. The case is different, if I surmise that zebras are likely to be obstinate, or otherwise disagreeable animals, because they seem to have a general resemblance to donkeys, and donkeys are self-willed. Here the donkey serves precisely as a probable likeness of the zebra. It is true we suppose that resemblance has a physical cause in heredity; but then, this hereditary affinity is itself only an inference from the likeness between the two animals, and we have not (as in the case of the photograph) any independent knowledge of the circumstances of the production of the two species. Another example of the use of a likeness is the design an artist draws of a statue, pictorial composition, architectural elevation, or piece of decoration, by the contemplation of which he can ascertain whether what he proposes will be beautiful and satisfactory. The question asked is thus answered almost with certainty because it relates to how the artist will himself be affected. The reasoning of mathematicians will be found to turn chiefly upon the use of likenesses, which are the very hinges of the gates of their science. The utility of likenesses to mathematicians consists in their suggesting, in a very precise way, new aspects of supposed states of things. For example, suppose we have a winding curve, with continual points where the curvature changes from clockwise to counter-clockwise and conversely as in figure 1. Let us further suppose that this curve is continued so that it crosses itself at every such point of reversed bending in another such

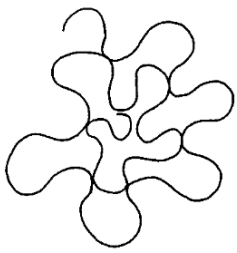

Fig. 1

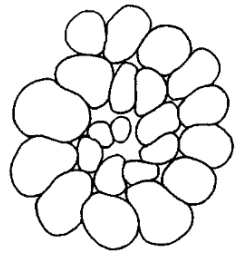

Fig. 2

point. The result appears in figure 2. It may be described as a number of ovals flattened together, as if by pressure. One would not perceive that the first description and the second were equivalent, without the figures. We shall find, when we get further into the subject, that all these different uses of likeness may be brought under one general formula.

In intercommunication, too, likenesses are quite indispensable. Imagine two men who know no common speech, thrown together remote from the rest of the race. They must communicate; but how are they to do so? By imitative sounds, by imitative gestures, and by pictures. These are three kinds of likenesses. It is true that they will also use other signs, finger-pointings, and the like. But, after all, the likenesses will be the only means of describing the

§6. *Symbols.* The word *symbol* has so many meanings that it would be an injury to the language to add a new one. I do not think that the signification I attach to it, that of a conventional sign, or one depending upon habit (acquired or inborn), is so much a new meaning as a return to the original meaning. Etymologically, it should mean a thing thrown together, just as *ἔμβολον* (embolum) is a thing thrown into something, a bolt, and *παράβολον* (parabolum) is a thing thrown besides, collateral security, and *ὑπόβολον* (hypobolum) is a thing thrown underneath, an antenuptial gift. It is usually said that in the word *symbol*, the throwing together is to be understood in the sense of to conjecture; but were that the case, we ought to find that *sometimes*, at least, it meant a conjecture, a meaning for which literature may be searched in vain. But the Greeks used "throw together" *(συμβάλλειν)* very frequently to signify the making of a contract or convention. Now, we do find symbol *(σύμβολον)* early and often used to mean a convention or contract. Aristotle calls a noun a "symbol," that is, a conventional sign.[4] In Greek,[5] a watch-fire is a "symbol," that is, a signal agreed upon; a standard or ensign is a "symbol," a watch-word is a "symbol," a badge is a "symbol"; a church creed is called a symbol, because it serves as a badge or shibboleth; a theatre-ticket is called a "symbol"; any ticket or check entitling one to receive anything is a "symbol." Moreover, any expression of sentiment was called a "symbol." Such were the principal meanings of the word in the original language. The reader will judge whether they suffice to establish my claim that I am not seriously wrenching the word in employing it as I propose to do.

Any ordinary word, as "give," "bird," "marriage," is an example of a symbol. It is *applicable to whatever may be found to realize the idea connected with the word;* it does not, in itself, identify those things. It does not show us a bird, nor enact before our eyes a giving or a marriage, but supposes that we are able to imagine those things, and have associated the word with them.

§7. A regular progression of one, two, three may be remarked in the three orders of signs, Likeness, Index, Symbol. The likeness has no dynamical connection with the object it represents; it simply happens that its qualities resemble those of that object, and excite analogous sensations in the mind for which it is a likeness. But it really stands unconnected with them. The index is physically connected with its object; they make an organic pair. But the interpreting mind has nothing to do with this connection, except remarking it, after it is established. The symbol is connected with its object by virtue of the idea of the symbol-using mind, without which no such connection would exist.

Every physical force reacts between a pair of particles, either of which may serve as an index of the other. On the other hand, we shall find that every intellectual operation involves a triad of symbols.

§8. A symbol, as we have seen, cannot indicate any particular thing; it denotes a kind of thing. Not only that, but it is itself a kind and not a single thing. You can write down the word "star"; but that does not make you the

creator of the word, nor if you erase it have you destroyed the word. The word lives in the minds of those who use it. Even if they are all asleep, it exists in their memory. So we may admit, if there be reason to do so, that generals are mere words without at all saying, as Ockham supposed,[6] that they are really individuals.

Symbols grow. They come into being by development out of other signs, particularly from likenesses or from mixed signs partaking of the nature of likenesses and symbols. We think only in signs. These mental signs are of mixed nature; the symbol-parts of them are called concepts. If a man makes a new symbol, it is by thoughts involving concepts. So it is only out of symbols that a new symbol can grow. *Omne symbolum de symbolo.*[7] A symbol, once in being, spreads among the peoples. In use and in experience, its meaning grows. Such words as *force*, *law*, *wealth*, *marriage*, bear for us very different meanings from those they bore to our barbarous ancestors. The symbol may, with Emerson's sphynx,[8] say to man,

Of thine eye I am eyebeam.

§9. In all reasoning, we have to use a mixture of *likenesses*, *indices*, and *symbols*. We cannot dispense with any of them. The complex whole may be called a *symbol*; for its symbolic, living character is the prevailing one. A metaphor is not always to be despised: though a man may be said to be composed of living tissues, yet portions of his nails, teeth, hair, and bones, which are most necessary to him, have ceased to undergo the metabolic processes which constitute life, and there are liquids in his body which are not alive. Now, we may liken the indices we use in reasoning to the hard parts of the body, and the likenesses we use to the blood: the one holds us stiffly up to the realities, the other with its swift changes supplies the nutriment for the main body of thought.

Suppose a man to reason as follows: The Bible says that Enoch and Elijah were caught up into heaven; then, either the Bible errs, or else it is not strictly true that all men are mortal. What the Bible is, and what the historic world of men is, to which this reasoning relates, must be shown by indices. The reasoner makes some sort of mental diagram by which he sees that his alternative conclusion must be true, if the premise is so; and this diagram is an *icon* or likeness. The rest is symbols; and the whole may be considered as a modified symbol. It is not a dead thing, but carries the mind from one point to another. The art of reasoning is the art of marshalling such signs, and of finding out the truth.

3

Of Reasoning in General

MS 595. [Published in part in CP 2.282, 286–91, 295–96, 435–44, and 7.555–58. This is the first part of a work entitled "Short Logic" that Peirce began in 1895 for Ginn & Co. (who had rejected his lengthy "How to Reason"). This is the only chapter Peirce wrote.] The relationship between logic and semiotics is more deeply examined in this selection. Peirce considers reasoning in a broad context that includes both the process of belief change and the expression of thoughts in language, but he stresses the centrality of signs for reasoning. Here, as in the second selection, he focuses on icons, indices, and symbols, again giving many helpful examples, and applies this classification in his analysis of propositions and inferences. He divides the study of signs into three branches, which he calls the philosophical trivium: *speculative grammar, logic, and speculative rhetoric. Peirce then explains our success in discovering natural laws by our affinity with nature.*

Article 1. *Logic* is the art of reasoning.

The old times saw endless disputes as to whether logic was an *art* or a *science*. It is not worth while even to explain what those words were taken to mean. The present definition, respectable in its antiquity and superficiality, is intended merely to afford a rough preliminary notion of what this treatise is about. This chapter shall tell something more; but the student cannot expect to attain a real comprehension of the nature of logic till after he has gone through the book.

The facts upon which logic is based come mostly within ordinary knowledge; though many escape ordinary notice. The science is largely, not wholly, one of rearrangement.

Article 2. *Reasoning* is the process by which we attain a belief which we regard as the result of previous knowledge.

Some beliefs are results of other knowledge without the believer suspecting it. After a sojourn among young people exclusively, an acquaintance met may seem to have aged more than he really has. This is a case of error. But not all such results are erroneous. A stranger with whom I am dealing may make an impression of being dishonest owing to indications too slight for me to know what they are. Yet the impression may be well founded. Such results are usually set down to "intuition." Though inferential in their nature, they are not exactly *inferences.*

Again, a given belief may be regarded as the effect of another given belief, without our seeming to see clearly why or how. Such a process is usually called an *inference;* but it ought not to be called a *rational inference,* or *reasoning.* A blind force constrains us. Thus, Descartes declares himself obliged to believe that he exists because he remarks that he thinks. Yet he seems to doubt (in that stage of his inquiry) whether everything that thinks exists.

The word *illation* signifies a process of inference. Reasoning, in general, is sometimes called *ratiocination. Argumentation* is the expression of a reasoning. *Argument* may be mental or expressed. The belief to which an inference leads is called the *conclusion,* the beliefs from which it sets out are called the *premises.* (Sometimes written *premisses.*) The fact that the premises necessitate the truth of the conclusion is called the *consequence,* or *following* of the conclusion from the premises.

Article 3. A *Belief* is a state of mind of the nature of a habit, of which the person is aware, and which, if he acts deliberately on a suitable occasion, would induce him to act in a way different from what he might act in the absence of such habit.

Thus, if a man *believes* a straight line to be the shortest distance between two points, then in case he wishes to proceed by the shortest way from one point to another, and thinks he can move in a straight line, he will endeavor to do so. If a man really believes that alcohol is injurious to him, and does not choose to injure himself, but still drinks for the sake of the momentary satisfaction, then he is not acting deliberately. But a habit of which we are not aware, or with which we are not deliberately satisfied, is not a belief.

An act of consciousness in which a person thinks he recognizes a belief is called a *judgment.* The expression of a judgment is called in logic a *proposition.*

Article 4. "The unit of speech is the sentence," says one of the most illustrious of living linguists, the Rev. A. H. Sayce, in the article "Grammar" in the *Encyclopaedia Britannica.*[1] Modern logicians have come to a conclusion analogous to that of modern linguists in holding that the unit of thought is the judgment.

Still, it is as necessary in logic to dissect judgments as it is in grammar to analyze sentences.

Our grammars teach that a perfect sentence consists of a *subject* and *predicate.* There is some truth in that; yet it rather forces the facts to bring all sentences even in the European languages to that form. But Indo-European languages are to all languages what phanerogams are to plants as a whole or vertebrates to animals as a whole, a smallish part though the highest type. Grammarians are children of Procrustes and will make our grammar fit all languages, against the protests of those to whom they are vernacular. In the Eskimo tongue what we call the subject is generally put in the genitive case, and in many languages, except for proper names, words that are distinctly and decidedly nouns are quite exceptional. Still, there is something like a subject and a predicate in most languages; and something of the sort must

exist in every logical proposition. In order to be able to understand precisely how this is we must turn our attention to signs.

Article 5. A *sign* is a thing which serves to convey knowledge of some other thing, which it is said to *stand for* or *represent.* This thing is called the *object* of the sign; the idea in the mind that the sign excites, which is a mental sign of the same object, is called an *interpretant* of the sign.

Signs are of three classes, namely, *Icons* (or images), *Indices,* and *Symbols.*

Article 6. An *icon* is a sign which stands for its object because as a thing perceived it excites an idea naturally allied to the idea that object would excite. Most icons, if not all, are *likenesses* of their objects. A photograph is an icon, usually conveying a flood of information. A piece of mimicry may be an auditory icon. A diagram is a kind of icon particularly useful, because it suppresses a quantity of details, and so allows the mind more easily to think of the important features. The figures of geometry are, if accurately drawn, such close likenesses of their objects that they are almost instances of them; but every student of geometry knows that it is not all necessary, nor even useful, to draw them so nicely, since if roughly drawn they still sufficiently resemble their objects in the particulars to which attention has to be drawn. Many diagrams resemble their objects not at all in looks; it is only in respect to the relations of their parts that their likeness consists. Thus, we may show the relation between the different kinds of signs by a brace, thus:

$$\text{Signs} \begin{cases} \text{Icons} \\ \text{Indices} \\ \text{Symbols} \end{cases}$$

This is an icon. But the only respect in which it resembles its object is that the brace shows the classes of *icons, indices,* and *symbols* to be related to one another and to the general class of signs, as they really are, in a general way. When, in algebra, we write equations under one another in a regular array, especially when we put resembling letters for corresponding coefficients, the array is an icon. Here is an example:

$$\begin{aligned} a_1x + b_1y &= n_1, \\ a_2x + b_2y &= n_2. \end{aligned}$$

This is an icon, in that it makes quantities look alike which are in analogous relations to the problem. In fact, every algebraical equation is an icon, in so far as it *exhibits,* by means of the algebraical signs (which are not themselves icons), the relations of the quantities concerned.

It may be questioned whether all icons are likenesses or not. For example, if a drunken man is exhibited in order to show by contrast, the excellence of temperance, this is certainly an *icon,* but whether it is a likeness or not may be doubted. The question seems somewhat trivial.

Along with such indexical directions of what to do to find the object meant, ought to be classed those pronouns which should be entitled *selective* pronouns, because they inform the hearer how he is to pick out one of the objects intended, but which grammarians call by the very indefinite designation of *indefinite* pronouns. Two varieties of these are particularly important in logic, the *universal selectives*, such as *quivis*, *quilibet*, *quisquam*, *ullus*, *nullus*, *nemo*, *quisque*, *uterque*, and in English, *any*, *every*, *all*, *no*, *none*, *whatever*, *whoever*, *everybody*, *anybody*, *nobody*. These mean that the hearer is at liberty to select any instance he likes within limits expressed or understood, and the assertion is intended to apply to that one. The other logically important variety consists of the *particular selectives*, *quis*, *quispiam*, *nescio quis*, *aliquius*, *quidam*, and in English, *some*, *something*, *somebody*, *a*, *a certain*, *some or other*, *a suitable*, *one*.

Allied to the above pronouns are such expressions as *all but one*, *one or two*, *a few*, *nearly all*, *every other one*, etc. Along with pronouns are to be classed adverbs of place and time, etc.

Not very unlike these are, *the first*, *the last*, *the seventh*, *two-thirds of*, *thousands of*, etc.

Other indexical words are prepositions, and prepositional phrases, such as *on the right* (or *left*) *of*. Right and left cannot be distinguished by any general description. Other prepositions signify relations which *may*, perhaps, be described; but when they refer, as they do oftener than would be supposed, to a situation relative to the observed, or assumed to be experientially known, place and attitude of the speaker relatively to that of the hearer, then the indexical element is the dominant element.*

Article 8. Icons and indices assert nothing. If an icon could be interpreted by a sentence, that sentence must be in a "potential mood," that is, it would merely say, "Suppose a figure has three sides," etc. Were an index so interpreted, the mood must be imperative, or exclamatory, as "See there!" or "Look out!" But the kinds of signs which we are now coming to consider are,

*If a logician had to construct a language *de novo*,—which he actually has almost to do,—he would naturally say, I shall need prepositions to express the temporal relations of *before*, *after*, and *at the same time with*, I shall need prepositions to express the spatial relations of *adjoining*, *containing*, *touching*, of *in range with*, of *near to*, *far from*, of *to the right of*, *to the left of*, *above*, *below*, *before*, *behind*, and I shall need prepositions to express motions into and out of these situations. For the rest, I can manage with metaphors. Only if my language is intended for use by people having some great geographical feature related the same way to all of them, as a mountain range, the sea, a great river, it will be desirable to have prepositions signifying situations relatively to that, as *across*, *seaward*, etc. But when we examine actual languages, it would seem as though they had supplied the place of many of these distinctions by gestures. The Egyptians had no preposition nor demonstrative having any apparent reference to the Nile. Only the Eskimo are so wrapped up in their bearskins that they have demonstratives distinguishing landward, seaward, north, south, east, and west. But examining the cases or prepositions of any actual language we find them a haphazard lot.

by nature, in the "indicative," or, as it should be called, the *declarative* mood.* Of course, they can go to the expression of any other mood, since we may declare assertions to be doubtful, or mere interrogations, or imperatively requisite.

A *symbol* is a sign naturally fit to declare that the set of objects, which is denoted by whatever set of indices may be in certain ways attached to it, is represented by an icon associated with it. To show what this complicated definition means, let us take as an example of a symbol the word "loveth." Associated with this word is an idea, which is the mental icon of one person loving another. Now we are to understand that "loveth" occurs in a sentence; for what it may mean by itself, if it means anything, is not the question. Let the sentence, then, be "Ezekiel loveth Huldah." Ezekiel and Huldah must, then, be or contain indices; for without indices it is impossible to designate what one is talking about. Any mere description would leave it uncertain whether they were not mere characters in a ballad; but whether they be so or not, indices can designate them. Now the effect of the word "loveth" is that the pair of objects denoted by the pair of indices, Ezekiel and Huldah, is represented by the icon, or the image we have in our minds of a lover and his beloved.

The same thing is equally true of every verb in the declarative mood; and indeed of every verb, for the other moods are merely declarations of a fact somewhat different from that expressed by the declarative mood.

As for a noun, considering the meaning which it has in the sentence, and not as standing by itself, it is most conveniently regarded as a portion of a symbol. Thus, the sentence "every man loves a woman" is equivalent to "whatever is a man loves something that is a woman." Here "whatever" is a universal selective index, "is a man" is a symbol, "loves" is a symbol, "something that" is a particular selective index, and "is a woman" is a symbol.

Article 9. The astonishing variety which exists in the syntax of different languages shows that different men think the same fact in very different ways. There is no respect in which the constructions of languages differ more than in regard to the noun. Our Aryan languages are quite peculiar in the distinctness with which nouns are marked off from verbs. When we speak of a noun, we do not think of what its effect in a sentence may be, but we think of it as standing alone. Now a common noun *[such]* as "man," standing alone, is

*The nomenclature of grammar, like that of logic, is derived chiefly from a late Latin, the words being transferred from the Greek, the Latin prefix translating the Greek prefix, and the Latin stem the Greek stem. But while the logical words were chosen with fastidious care, the grammarians were excessively careless, and none more so than Priscian.[4] The word *indicative* is one of Priscian's creations. It was evidently intended to translate Aristotle's *ἀποφαντική*. But this is precisely equivalent to *declarative* both in signification and according to the rules of transference, *de*, taking the place of *ἀπό*, as is usual in these artificial formations (*de*monstration for *ἀπόδειξις*, etc.), and *clarare* representing *φαινειν*, to make clear. Perhaps the reason Priscian did not choose the word *declarativus* was that Appuleius, a great authority on words, had used this in a somewhat different sense.

certainly an index, but not of the object it denotes. It is an index of the mental object which it calls up. It is the index of an icon; for it denotes whatever there may be which is like that image. *[. . .]*[5]

There are too many types of speech to allow the insertion here of illustrations of all the different ways in which one and the same fact is thought by different peoples. Sufficient has been said to show the danger of assuming that because a certain way of thinking is natural to us Aryans, therefore, in the absence of any more positive evidence than that no other way occurs to *us*, it is a law of the human mind that man must think in that way. Still more presumptuous would it be to assume on those grounds that a given form of thought belongs to every intelligent being.

Article 10. Thinking a fact in a different way will not alter its value as a premise or as a conclusion. Whether from the judgment, *A*, it is proper to infer the judgment, *C*, depends upon whether or not the fact which *A* expresses could possibly take place without the fact which *C* expresses going along with it. On this connection of *facts* mere thinking can have no effect.

But it is now time to draw attention to three different tasks that are set before teacher and learner of the art of reasoning.

The principal business of logic is to ascertain whether given reasonings are good or bad, strong or weak. In this regard, whether we think our propositions in one form or in another is of no more consequence than whether we express them in English or in German, whether we write them or enunciate them, whether we drawl or gabble. In the eye of logic, two propositions expressing the same fact are *equivalent*, or virtually (at least) identical.

Accordingly, the practice of logicians has always been to adopt certain *canonical forms* in which they require that judgments should be expressed, before the reasonings which involve them are brought before them for examination. In choosing these forms, logicians need not be biased by the usage of any languages nor by the ways in which Aryans, or all the races of this little planet, may employ in their thinking. They will do best to take the forms which are the most convenient for their own purpose of tracing the relationship of dependence between one *fact* and another.

To say whether a given way of thinking is correct or not, it is requisite to consider what facts the thought expresses. To this, then, those who occupy themselves with the art of reasoning must attend. The logician cannot be asked to teach the tongues: it is the business of the philologist to do that. Syntax must explain what facts different forms of expression signify; and the forms of expression undoubtedly follow in the main the ways of thinking. Comparative syntax is a recognized branch of philology; and this must survey the whole ground of different ways of thinking the same fact, so far as they betray themselves in speech. Thus, a very important part of the labor of the art of reasoning is undertaken by the grammarian, and may be severed from logic proper. Every form of thinking must betray itself in some form of expression or go undiscovered. There are undoubtedly numerous other ways of making assertions besides verbal expressions, such as algebra, arithmetical

connected, or *simultaneously conjoined.* The matter of compound icons will have to be more fully considered in another chapter.[12]

Article 12. It is now time to examine more carefully the nature of *inference*, or the conscious and controlled adoption of a belief as a consequence of other knowledge. The first step of inference usually consists in bringing together certain propositions which we believe to be true, but which, supposing the inference to be a new one, we have hitherto not considered together, or not as united in the same way. This step is called *colligation.* The compound assertion resulting from colligation is a *conjunctive proposition*, that is, it is a proposition with a composite icon, as well as usually with a composite index. Colligation is a very important part of reasoning, calling for genius perhaps more than any other part of the process. Many logicians refuse the name of reasoning to an inferential act of which colligation forms no part. Such an inferential act they call an *immediate inference.* This term may be accepted; but although colligation certainly gives a higher intellectuality to inference, yet its importance is exaggerated when it is represented to be of more account than the conscious control of the operation. The latter ought to determine the title of *reasoning.*

An inference, then, may have but a single premise, or several premises may be united by colligation. In the latter case, they form, when colligated, one conjunctive proposition. But even if there be but one premise, the icon of that proposition is always more or less complex. The next step of inference to be considered consists in the contemplation of that complex icon, the fixation of the attention upon a certain feature of it, and the obliteration of the rest of it, so as to produce a new icon.

If the question is asked in what the processes of contemplation and of fixation of the attention consist, this question being psychological, it is necessary, before answering it, to describe some phenomena of the mind. As psychological, not logical, facts, they can only be briefly stated here, without the evidence on which their truth rests. Suffice it to say, on that head, that they are not hastily adopted, but result from an exact discussion of special experiments. It must be premised that the word *feeling* is used throughout this book to denote that which is supposed to be immediately, and at one instant, present to consciousness. The words "supposed to be" are here inserted because we cannot directly observe what is instantaneously present to consciousness. To speak of no other hindrance, before we can get attention focused upon what is immediately present, instead of upon the practical or emotional aspects which had been interesting us, the idea has gone by, and the memory of it represents it transformed and worked up in the process of thought. We infer, however, from what we can observe, that feeling is subject to degrees. That is to say, besides the *objective intensity*, which distinguishes a loud sound from a faint one, there is a *subjective intensity*, which distinguishes a lively consciousness of the sound from a dull consciousness of it. Though the two intensities are apt to go together, yet it may happen that a person

recalls the tick of a watch most intensely, at the same time that he hardly can recall the sound of an explosion, which, so far as he does remember it, he remembers as very loud. For example, suppose a person lying awake in bed in perfect darkness is endeavoring to recall an aunt of his early childhood, and is trying to remember, what he scarce *can* remember, how an explosion he heard really sounded. Suppose that, while he is so occupied, he suddenly hears a watch ticking, although, so far as he knows, there is no watch in the room. He pricks up his ears; he tries again to make out the ticking. He hears it no more; but he remembers it most vividly. One cause of this intensity is the recency of the ticking; another is the interest he has in it. The intensity itself belongs to the feeling, and does not consist in the strength of the association. In thinking of the long past explosion, an *allowance* is made in the estimation of its loudness for the remoteness of the sensation. But that allowance is not a merely intellectual one; it affects the feeling. Dim as the feeling is, it is the feeling of a very loud sound. Lively as the other feeling is, it is the feeling of a very faint sound.

Feelings of such low subjective intensity as usually to pass unnoticed act upon one another, undergo transformations in a thinking process, and excite emotions and voluntary actions, just as lively feelings do. But they do those things more slowly, as a rule, and less decidedly than they would do if they were livelier. Moreover, other things being equal, the ideas of which we are little conscious are little under direct control. This, however, needs qualification. A feeling forced upon the mind through the senses, so as to bear down the power of the will, is almost always of a high grade of subjective intensity. We shall soon see why it should be so. But when a feeling is *not* thus forced upon us, it is the more manageable the livelier it is. Everybody knows that it is much easier to trace out suppositions about things interesting than about things uninteresting, when, at least, the interest is not so immediate as to force us to leave off scheming and commence acting.

There are certain combinations of feelings which are specially *interesting*,—that is, they are strongly suggestive of thought. *What* combinations are interesting? Answer: those which are very near a reaction between mind and body, whether in sense, in the action of the glands, in contractions of involuntary muscles, in voluntary outward acts, or in inward acts by which one part of the nerves discharge in an extraordinary manner upon another. The interesting combination of ideas, when formed, increases rapidly in subjective intensity for a short time; although later, after habits are formed, it is less intense for being interesting.

The action of thought is all the time going on, not merely in that part of consciousness which thrusts itself upon attention, but also in those parts that are deeply shaded and of which we are too little conscious to be much affected by what takes place there. But when, in the uncontrolled play of that part of thought, an interesting combination occurs, its subjective intensity increases for a short time with great rapidity. This is the phenomenon which

INDEX