

## THE ANCIENT AND MEDIEVAL ROOTS OF PEIRCEAN PHILOSOPHY

DL EVERETT

DEVERETT@BENTLEY.EDU

*"[I intend] to make a philosophy like that of Aristotle, that is to say, to outline a theory so comprehensive that, for a long time to come, the entire work of human reason, in philosophy of every school and kind, in mathematics, in psychology, in physical science, in history, in sociology and in whatever other department there may be, shall appear as the filling up of its details."* cited in Oakes 1993

Peirce revealed the influence of Greek philosophy through his writings in many ways.<sup>1</sup> He saw his roots clearly and recognize them explicitly, especially from the time of ancient

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<sup>1</sup> In Ms. 1604: "Have read the fragments of early Greek philosophers. All in Aristotle about them. Translation of Diogenes Laertius with an old commentary (Menage?). Have read Cudworth, Röth, Zeller, Brandis, Erdmann, and a great deal about them. Have at one time or another specially got up most of them. Have examined the fragments of Pherecydes and Zimmermann's book.

Have studied all I could about Thales in relation to his life (about which I have an interpretation of my own) his mathematics, his theories.

Have made a very particular study of Pythagoras. Have read connectedly all the passages of Aristotle. The life by Jamblichus, and nearly every passage relating to him in

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ancient authors (some only in trans.) in their context. [Have never read Porphyry's life of Pythagoras. A serious omission. But have read in it]. Have read a dozen or so modern authors about him. In the light of \_\_\_\_\_'s argument that his doctrines were Indian, which I assent to, I have got a way of reconciling the statements of ancient authorities about his life; and this affords a key by which I estimate the value of the statements concerning his philosophy. I consider my work on this a fine pièce of logic.

My reading in the atomistic philosophy will be mentioned below.

2. Plato. Have read Plato only in translation; only a dialogue or two in Greek. Never was intensely interested in Plato. Have read Zeller, Grote, and many special discussions. My description of Platonism was written at Niagara Falls without a single book to refer to. It was subsequently revised but not much changed. 3. Aristotle. Have read and thought more about Aristotle than about any other man. Have minutely and painfully gone through in the original with such commentaries as seemed the most instructive (always two at least on every part) the whole Organon, all but a small part of the Metaphysics, and the De Anima. Have also read in the original with inferior commentaries the Φυσικη ακροασις.

[Also the book about sensation].

Have also read in the original the de memoria et reminiscentia, and I think the book about sleep, and that about life and death. I have looked over the Problems. Have read the Nicomachaeian Ethics in translation & skimmed a translation of the Politics. The Rhetoric I have only read in in the original. The Poetry I know nothing about. The de Caelo and De Generatione I have only read in, I guess, though as different times a good deal. The

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Meteorologica I know still less about. There are various Natural History things I have hardly looked at.

I have run over the whole collection picking out special things I rambled, especially about the history of human thought.

I have read many of the Scholia and other comments included in the Berlin edition.

Have read various general studies of Aristotle.

4. Stoics. Most superficial philosophy this. More like New York and the Nation than anything I know. Yet I have faithfully read a good deal Seneca's letters, the Enchiridion of Epictetus (trans.), translation of Marcus Aurelius, probably all there is in Cicero, a good deal in transl. of Plutarch. There is also much about Stoicism in Sextus which I have studied on good deal.

5. Epicureanism and atomism. One of my pets in philosophy. It is remarkable how much I still have to do in this dissection's but still I have done a good deal. I never read Lucretius! Of course, I have read parts, but I never felt like undertaking a real study such as I ought to make. It is one of my great desiderata. I haven't a copy of it for one thing.

Empedocles, Democritus and Anaxagoras I do not know as I ought to. I have studied parts of Karsten, Mullach (three books), and Ersch and Grüber's articles with great care, booking up all the ancient texts with context. The Ersch and Gruber article about Epicureism is also meritorious.

Greece to the era of the Scholastics. According to Peirce's synechism, the idea that everything in the universe is connected to everything else in the universe, ideas arise through a network of the ideas of all people across all times. Therefore, appropriately narrowing down our frame of reference in specific domains is an ever-present challenge. Our dividing lines can appear and can be arbitrary.

Max Fisch (Fisch 1971) examined the influence of Greek philosophy on the development and refinement of Peirce's thinking about a variety of topics. But there is more to learn about the

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Some of the Epicurean works I have studied with the greatest attention. I devoted months to the study of the small treatise of

Philodemus **περι σημειων και σημειωσικων**

I have probably been near a year ago and on reading Sextus ad. Math , and this contains much about the Epicureans. Also the Hypotyposes.

I have given a good deal of time to other Herculaneum papyre of Epicurean contents (beside the greek text. περι σημειων και σημειωσικων).

Have read Gassendi's Exercitationes and Syntagma Epicuri.

Of modern books on Epicureans, I have read nothing except such things as Zeller's wretched account of the doctrine. The truth is the doctrine is little understood or appreciated. A doctrine so unboastful, so emphasizing uncertainty, cannot be valued except by these who go to the substance; and that only highly trained scholars are able to do with perfect confidence."

Greek influence on Peirce. Greek thought permeates both Peirce's thinking and his values, that is, how he approaches reasoning in general.

Charles S. Peirce was a scientist and a philosopher, of both the analytic and synthetic varieties, conversant in and relevant to each of what we label today Continental and British-American philosophical traditions.<sup>2</sup> While I am not convinced that there are significant parallels between Peirce and Postmodernism, there do seem to be some minor affinities, as we see later. Modern day postmodernism, especially the versions emanating from France have unfortunately led many scholars to distance themselves in horror from the rubbery notions of "the French."<sup>3</sup>

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<sup>2</sup> E.g. Nielsen (1993), though I think it is a mistake to lump Peirce in this group. He would have been quite anti-postmodernist, in my opinion, even though Dewey and James might very well have viewed postmodernism favorably.

<sup>3</sup> In 1981 I was a PhD student in linguistics at the Universidade Estadual de Campinas in Brazil, sharing my office with visiting professor John Searle, from Berkeley. John and I got along very well and our mutual friend (and one of my most important mentors) Marcelo Dascal had assigned me as Searle's translator. One morning a Brazilian reporter asked Searle in Portuguese, through me, "What is your opinion about French philosophy?" Searle listened to my translation and replied "I don't understand the question." Both the reporter and I first believed that I must have translated the question poorly. I tried again. Searle replied "I understood the words. But what French philosophy? There hasn't been any philosophy in France for over 100 years." I translated this. The reporter raised her eyebrows, but duly transcribed my translation. Searle's perspective was not uncommon among his

But this type of overreaction is never healthy, especially in light of Peirce's synechism. We need to look for connections to understand the differences and to progress intellectually.

In fact, there is a sense in which all philosophy goes back to the roots of our genus, Homo. Reading and defining signs, reasoning inferentially, and evaluating our inferences based on practice are some of the most important topics in Peircean philosophy. And all hunter-gatherers live by their inferential and sign-reading abilities. The main hunter-gatherers prior to our species were Homo erectus, roughly two million years ago (Everett (2017), inter alia). But so far as we know erectus developed no philosophy (though in chapter fifteen it is argued that cultures *have* philosophy even when there are no specialists in the culture that *do* philosophy). But the lack of written evidence of Homo erectus cultural philosophy leads us back to our own species. Therefore, rather than millions of years, our examination of the roots of Peirce's philosophy begins recently, only about about two-thousand and seven hundred years ago in Ionia, Greece.

Peirce developed what is often labeled an "architectonic" theory of knowledge and how it is obtained, i.e. a typology of reasoning and its relationship to a typology of knowledge acquisition. There was design and purpose in his view of how all areas of human doubt-removal, e.g. chemistry, physics, mathematics, linguistics, literature, philosophy and so on fit together, support one another, and strive towards the truth together. This conception that all fits together, synechism and the architectonics of science, across all peoples and cultures in the universe, is perhaps what is most distinctive in Peirce's epistemology.

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British-American peers (Searle was educated at Oxford and taught at the University of California), it was only less diplomatically stated.

This means that although the whole may turn out to be greater than merely the sum of its parts (it will be because how the parts are connected matters) we cannot understand any science or philosophy without understanding not only the parts but how all the sciences of these parts converge on the whole. A "compositionality" of history.

Therefore, in order to understand any part of Peirce's architectonic theory of the growth of knowledge, we must first understand how each particular part fits into Peirce's system and how it developed in his thought. This chapter sets out to *briefly* explore the ancient and later sources that shaped Peirce's thinking. Because Peirce read widely and deeply, this requires more than a discussion of one or two influences. Following this survey, however, we should be in a much better position to understand Peirce's program as it relates to language, philosophy, culture, and the mind. Language analysis and ideas about linguistics rear their heads multiple times in the course of this history.

In one long set of remarks mentioned earlier, Peirce discusses his reading via a partial list of what he read of the ancients. His interests were catholic and profound. Both Peirce and Bertrand Russell (Russell (1945, Book One)), *inter alia*, recognized that Western philosophy began in the Greek region of Ionian settlements on the western border of Anatolia in the city of Miletus.<sup>4</sup>

Copleston's multivolume history of philosophy also begins with the Ionians in the late seventh and sixth centuries B.C.E: "The birthplace of Greek philosophy was the sea-board of Asia Minor and the early Greek philosophers were Ionians." (Copleston (1993, 13)) This is more

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<sup>4</sup> The central region of Ionia began at the river Hermus and continued to the city of Miletus, along the Maeander River.

than two hundred years before Aristotle (384-322 B.C.E) developed the first architectonic approach to knowledge.<sup>5</sup> Copleston (1993, 14-16) argues (and I agree) that the intellectual life of other civilizations (e.g. Egyptians) was far more applied (in math and religion) than the Greek theoretical, non-applied concerns and thus it is highly unlikely, implausible in fact, that the source of Greek thought is to be found anywhere but Greece. From what we can tell from the written record, the Ionians were the first to seek "knowledge for its own sake" and pursue "knowledge in a scientific, free, and unprejudiced spirit."<sup>6</sup>

In the 8th century B.C.E. the most famous Ionian of all, Homer, wrote his epic poems, *The Iliad* and *The Odyssey*. Although most do not consider Homer a philosopher, his poems' records of early Greek culture communicate the ranked values, knowledge structures, and fluid social roles (see Everett (2017a) for a theory of culture based on such concepts) that are the foundation for all philosophies. In fact, philosophy and culture form a symbiosis such that Homer's poems necessarily contain much philosophy even if Homer himself did not *do* philosophy.

Most philosophers do agree that another Ionian, decades after Homer, Thales (c. 626-545 B.C.E.) was the first "doer" of philosophy, one who wrote about it for theoretical ends (his

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<sup>5</sup> Copleston (1993, p13ff) notes that Hesiod, also an eighth century Greek poet, is a less likely candidate for philosopher rather than "merely" a poet, though he should not be forgotten in tracing the intellectual foundations of Greek thought.

<sup>6</sup> This is hyperbole to some degree. I have never met scientist or philosopher who pursued knowledge in an "unprejudiced spirit." After all, part of the purpose of developing theories is to develop biases and prejudices about the way the world works.

closest non-Western competitor is Confucius (c. 551-479 B.C.E.) was born roughly seventy years after Thales). As to his influence on Peirce, Peirce says in footnote 24: "Have studied all I could about Thales in relation to his life (about which I have an interpretation of my own), his mathematics, his theories..."

Aristotle also recognized Thales as the first Greek philosopher. Thales was a mathematician, astronomer, philosopher, and statesman (his interests thus overlapped considerably with Peirce's in the first three professional foci).<sup>7</sup>

Thales broke from the use of religion and mythology to explain the world, looking for natural explanations, setting an example for Peirce and all other philosophers. Thales did not take philosophy very far in technical details, but his great influence on subsequent thought came from geometrical proofs ("Thales Theorem" and the "Intercept Theorem"), as well as his overall quest for naturalist explanations of the natural world, the stages of life, and the good and bad facets of life. His example was noticed by Peirce.

One thing that emerges from the study of some of the Ionian pre-Socratic philosophers, especially Thales, is monism - the idea that all nature is one (in Thales's case, that all nature is in fact one substance, water). Peirce was also a monist, though not in this precise sense (and not only because he published so frequently in the journal *The Monist*).

Like Peirce, Thales broke from the religious traditions of his day, focusing not on religious explanations for natural phenomena but natural explanations. His focus on theory

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<sup>7</sup> Keeping Thales's interests in the family, Peirce's brother Herbert Henry Davis Peirce was a diplomat (US Ambassador to Norway, Third Assistant Secretary of State), representing the US government at the coronation of Tsar Nicholas II of Russia, for example.

means that there was nothing similar anywhere else in the world, certainly not in Africa or Asia. Egyptian mathematics, religion, and other intellectual pursuits were not only not theoretical but seriously inferior to Thales's work. There was no borrowing of significance from other parts of the world. Greek philosophy was original and sui generis, owing nothing to Africa, just as American Pragmatism owed very little, if anything to American Indian philosophies, in spite of works like (SOURCE).

From Thales we move to another Greek who influenced Peirce, Pythagoras (515-450 B.C.E.). One historian of philosophy sees a significant link between Pythagoras and Peirce:

*"Imagine yourself facing a stretch of bog. Behind you lies the dark realm of ancient Greek philosophy with its pre-Socratic fragments and Pythagoras... the first philosopher known for his triadic conception of the soul and a theorem to solve the angles of a triangle. On the other side of the bog awaits Charles Peirce and his triadic semeiotics and cenopythagorean phenomenology... The history of Western philosophy has been crossing this bog..."* Rebane (2020, 350)

As it was for Peirce, triadicity was crucial for Pythagorus's philosophy. "A distinctive characteristic of Pythagorean thought is complementarity of opposites. There are always two things and 'the third is a medium between the other two...'" (Rebane (2020, 351)).

Peirce comments occasionally on Pythagoras's life. However, there are several places of explicit and implicit theoretical interest in Peirce's program that clearly go back to Pythagoras. For example, in the Minute Logic (Ms. 425, 1902), para 120, Peirce says: "This list of categories

may be distinguished from other lists as the Ceno Pythagorean Categories on account of their connections with numbers."

Of his biography, Peirce comments cryptically, "The biography of Pythagoras rests on very poor evidence at best..." This quote does more than give an esoteric biographical opinion of Peirce's. It illustrates how Peirce's reading was far more extensive than evidenced in his available manuscripts and publications, making it clear that he had read and thought intensively about Pythagoras's biography but wrote nothing further about it that we know of.

In his logic Peirce goes on to comment that (Logic, para 126): "Pythagoras is commonly regarded as a man of mystical tendencies but I am not clear that he was so. His brotherhood seem to have pursued the most practical ends and all the mysticism of as much of the number of theory as probably belonged to him is sufficiently explained by excessive crudeness of his ideas. He seems to have been something of a charlatan..."

Peirce was one of several American thinkers profoundly influenced by the triadic theme in the work of Pythagoras and others down through history, (one of the others was Kenneth L. Pike (Pike (1967), my first linguistics professor and founder of the theory of Tagmemics, with its many triads). Chase (1863) traces triadic concepts in philosophy, stating:

*"The simplest possible form of division is dual, but in treating of the faculties or capacities of Mind, there has been a very general recognition of triplicity. From the days of Pythagoras, who recognized in the soul three elements, Reason ..., Intelligence ... , and Passion ... to those of Hegel, who finds the manifestations of the Idea in Soul, Consciousness, and Reason, a fundamental ternary division has been adopted, with a marvellous unanimity which I can account for only by supposing it either to have been*

*taught among the esoteric mysteries that shadow forth some of the earliest direct revelations to our race, or to have been founded on some obscure and dimly seen necessity of things."*

Beyond Pythagoras other pre-Socratic philosophers were of relevance to Peirce, though we cannot survey them all here. For example (Nöth 2018, p3) Heraclitus was another:

*"Fragment 93 of Heraclitus informs us that the oracle at Delphi 'neither utters nor hides his meaning, but shows it by a sign.' Incidentally, since Heraclitus put these words into the mouth of the priestess Pythia, his testimony is evidence that the first semeiotician in the history of thought was female."*

Peirce wrote (summarized by John Kaag) after 1900 "... the ideal scientist is free to muse upon a variety of new experiences, to hypothesize in genuinely novel ways, and to test these hypotheses with methods of ever-increasing rigor. Peirce suspects that the outcomes of this type of investigation will not fit into the cultural norms (ethoi) that govern all of present-day society and will be deemed unethical on these grounds." This is similar to Socrates's own ideas towards society, at least the one that poisoned him. And it also summarizes Peirce's treatment by the establishment (ostracized for being unethical, though not merely for research) and that of Socrates. Kaag's article argues that Peirce is a Socratic. Peirce knew Socrates very well in fact and this description fits to a degree, though no single description captures any serious thinker's full profile.

Although Peirce argued (1893, Lowell lecture V) that Socratic induction as presented by Plato was unscientific, disparaging Plato to some extent, in 1905 (O'Hara 2005, p39) he seems to have come to a more positive assessment of Socrates. He wrote to Victoria Lady Welby of his admiration for Plato and Socrates, claiming that what he had earlier criticized as "induction" was in fact a early Socratic attempt at abduction, which he, Peirce, admired. Thus Peirce benefitted a great deal from Plato and by all indications knew his work very well, gaining many insights on realism, pragmatism, and inference that bore directly on Peirce's own research and thought.

(GIVE SOURCE FROM LETTERS)

As O'Hara (2005, p3ff) states:

*"Throughout his adult life, Peirce wrote extensively on Plato. His writings on Plato appear in many contexts, including investigations into the life of Plato, studies of Plato's method of investigation, translations of Plato's dialogues, and detailed notes concerning the stylistic tropes Plato employed... Plato was a rich resource for stimulating Peirce's own thought. Peirce tried his hand at writing Platonic dialogues, and reference to Plato often appear in those of Peirce's writings where he is attempting to work through some newly discovered problem. Peirce's early reading of Plato seems to have helped him to develop his early formulation of pragmatism... In the last two decades of his life, Peirce looked to Plato for a model of revising his own metaphysics and method of inquiry."*

Peirce finds in Plato (O'Hara (2005, 19ff) both nominalism and realism, depending on which aspect of Plato's work he is examining. This was important for Peirce's thinking about these issues. Whether it is Peirce's analysis of Plato or Plato's own system that is inconsistent

(Peirce claimed that Plato "misunderstood himself"), Peirce was forced to contemplate the implications of this inconsistency in Plato or his own interpretation of Plato as he himself developed his perspective on nominalism and realism.

*"As to Plato, unless we are content to treat the only complete collection of the works of any Greek philosopher that we possess as a mere repertory of gems of thought, as most readers are content to do; but wish to view them as they are so superlatively worthy of being viewed as the record of the entire development of thought of a great thinker, then everything depends upon the chronology of the dialogues."* Charles S. Peirce, 1898 (Ms. 434)<sup>8</sup>

Peirce ultimately saw Plato as a Pragmatist and a Realist, as did Peirce's friend F.C.S. Schiller, who said "Plato held that ... man is the measure of all things, not in his experience of

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Peirce was a nominalist before he became a scholastic realist. This has been convincingly argued by Max Fisch.<sup>1</sup> [1. Cf. Fisch's "Peirce's Progress from Nominalism towards Realism." The Monist (1967), pp. 139-178. [PS&P 184-200.]

Fred Michael: "Two Forms of Scholastic Realism in Peirce's Philosophy. Transactions of the CSP Society Vol. XXIV No. 3 (Summer 1988)

Continuation (FM) Yet Fisch's view has not been generally accepted; it has been disputed, some say refuted, by Don Roberts.<sup>2</sup> [Cf. Don Roberts, "On Peirce's Realism," Transactions (1970) 67-83.] Michael's footnote continues: It should be mentioned that Roberts now accepts Fisch's view.

particular facts, as Protagoras would have it, but in his knowledge of reason, which alone is ennobling." (Schiller (1908))

Although Plato certainly influenced Peirce's thinking, just as he influenced most if not all philosophers who followed him, it is his famous student, Aristotle (384-322 B.C.E.), who had the strongest influence on Peirce.

Like Peirce, Aristotle was an assiduous analyst of categories. In his analysis he divides theoretical philosophy into three "approaches" (Copleston 1993, p277ff):

- (i) Theoretical philosophy - knowledge as the end not the means to a practical end
  - a. Physics/Natural Philosophy - material things subject to motion
  - b. Mathematics - unmoved but unseparated from matter
  - c. Metaphysics - separated (transcendent) from matter and unmoved (includes natural theology)

He then cordons off non-theoretical philosophy as worthy of attention though perhaps less academically interesting:

- (ii) Practical philosophy

Political science, including strategy, economics etc

Aristotle's logic is "formal logic" - analysis of the forms of thought.

Of pupil and teacher, Peirce considered the student Aristotle the better or at least more interesting and more relevant philosopher, because Aristotle was more systematic, more consistently realist, more scientific, and not dependent on "heaven" or such notions for any part of his philosophy. Few if any other philosophers influenced Peirce more than Aristotle. In logic, for example, Peirce referred to Aristotelian syllogisms as "perfect symbols" (they were not the only perfect symbols, but they were complete arguments and thus their conclusion carried their

interpretation, using them to further derive formal definitions of induction and abduction, even though Aristotle designed them to illustrate deduction. Propositions, which are constituents of syllogisms (discourse, conversations, and so on) are not themselves perfect symbols. This turns out to be important in Peirce's work on languages and its relevance to modern linguistics.

Aristotle's entire logic comes up frequently in Peirce's writings and the discovery of abduction (which Peirce admits can be found perhaps first, though crudely, in Socrates) is derived by *transforming* the basic constituents of Aristotelian syllogistic reasoning (see chapter eight below). Likewise, the rest of Aristotle's logic, e.g. induction and deduction influenced Peirce greatly. Peirce writes positively of Aristotle's attempts at scientific method, constraining his explanations with what we know of the natural world, rather than "heaven" or "gods," as Plato and others before Aristotle commonly did. Aristotle's classifications of the different parts of the world and his architectonic arrangement of the sciences was also very important in the development of Peirce's thought. Aristotle also wrote on semeiotics and the interpretations of signs (where a sign was broken into form vs. matter, as opposed to, say, form and content).

Among Aristotle's greatest influences on Peirce, interestingly enough, was the concept of "final cause." "In Peirce's view, our pursuit of scientific explanation leads us to conclude that final causality is indeed operative in the world." (Hawkins, 2007 p 521)

Aristotle's theory of causation distinguished four distinct causes behind the facts we observe in the universe: material, formal, efficient, and final. In his *Physics* (194b15-195b30), Aristotle illustrates all four causes via his description of a bronze statue. As Hawkins (2007, 523) reports,

*"In Aristotle's view, we cannot claim to know a thing until we have knowledge of each of these causes. The material cause is the stuff (bronze [in Aristotle's example, DLE]) of which the statue is made. The efficient cause is the sculptor who uses his skills to bring the statue into the proper form. The form or shape that the statue comes to have is its formal cause. And the final cause is in this case the sculptor's aim or end in introducing that shape into that material."*

Aristotle's theory of causation influenced Peirce's understanding of scientific explanation (in this section I lean particularly on Hawkins (2007), among other sources). Peirce (EP2:315-316 [1904]) explains Aristotle's four causes as follows:

*"The individuating internal cause is called the material cause. Thus the integrant parts of a subject or fact form its matter, or material cause. The individuating external cause is called the efficient, or efficient cause, and the causatum is called the effect. The defining internal cause is called the formal cause, or form. All these facts which constitute the definition of a subject or fact make up its form. The defining external cause is called the final cause, or end. It is hoped that these statements will be found to hit a little more squarely than did those of Aristotle and the scholastics the same bull's eye at which they aimed."*

As Hawkins states (2007, p521) "Peirce was greatly influenced by Aristotle, particularly on the topic of final cause." This is interesting in light of the fact that many philosophers consider Aristotle's final cause to be unhelpful and misguided. Once again, Peirce's opinion

differs from that of the majority: "In Peirce's view, our pursuit of scientific explanation leads us to conclude that final causality is indeed operative in the world." (Hawkins (2007, p522)

In his classifications the teleological force of final cause plays a crucial role. Consider your own final cause, or mine. Is there indeed some "ideal" Daniel that is shaping me to become the Daniel that I am and am ever-evolving into? Well, yes, in the sense that cultural (material accumulation or altruism, for example), intellectual, spiritual, and other ends we all have in mind constrain who we become. They do this by means of morality, teachings in schools, laws, and politics among many other forces and serve for all individuals as a final Aristotelian cause in our lives.

Peirce's finding that Aristotelian final causation plays a crucial role in modern science is somewhat shocking because many philosophers and scientists over the years have claimed that the idea of final cause is of no significance. For example: "The development or behavior of an individual is purposive, natural selection is definitely not... Darwin has swept out such finalistic teleology by the front door." Mayr (1961, 1501ff). And yet this is false. Survival is the final cause of the individual and the species and it shapes us all via natural selection which is indeed in this sense teleological.

Aristotle was succeeded by others of course, but of the two schools of thought that were rivals in their days both exerted significant influence on Peirce - the Stoa (Stoics) and the Epicureans. Although footnote xxx indicates that Peirce valued the Stoics' philosophy less than that of their contemporary rivals, the Epicureans, the Stoics actually developed a theory of signs and propositions that is similar in many ways to Peirce's own theories. And Peirce knew this. Although the term "semeiotics" was not yet in use by the time of Plato, the theory of signs was out to "unveil" the mystery behind signs in the world, i.e. to help us to find what Peirce would

call the signs' "interpretants." (Nöth 2018, 3). Following Plato and Aristotle, both interested in the "doctrine of signs," the most important work, read by Peirce as well, was that of the Stoics and the Epicureans.

Zeno of Citium (c.334-262 B.C.E.) (not to be confused with Zeno of Elea (495-430 B.C.E., the author of the famous paradoxes, nor with Zeno of Sidon (c.150 – c.75 B.C.E.) a later Greek Stoic) was the founder of the Stoics (originally called Zenoans). The Stoics took their name from the colorful porch where they used to meet, the Stoa Poikile (ή ποικίλη στοά) on the side of the Agora in Athens. The Stoics (a more modern spelling) initially were made up of Syrian Greeks, though later most were Roman, including even the Roman emperor Marcus Aurelius (121-180 A.D)).

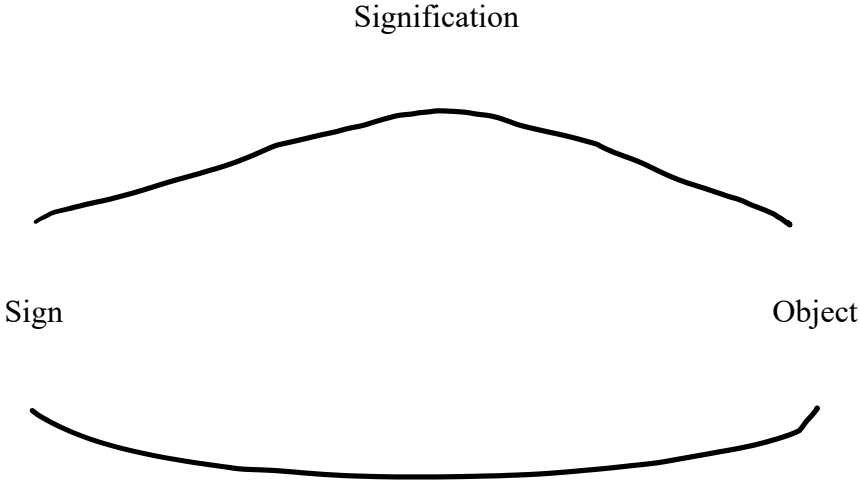
The Stoics were known for the view that virtue was the way to happiness or contentment. Following a life of virtue was crucial for the good life. But virtues included the life of the mind, manifested in understanding and science. To further that understanding and knowledge of the world, the Stoics did some of the earliest and best work on the theory of signs. (What follows immediately leans heavily on Covington (1978)).

For both of these schools, according to Noth (2018, p 3) the study of signs was important in itself and as a source of insights into human cognition. Augustine of Hippo (354-430 A.C.E.) developed a theory of the distinction between "signs and things," by which one might conclude that he was giving thought to what Peirce would distinguish as representamen & interpretant vs. objects.

The Stoics were an outgrowth of the school of Euclid of Megara around 400 B.C.E., who in turn had been a student of Socrates. The Stoics developed a *science of discourse* (Covington

2006) and a triadic theory of semeiotics (which makes it quite curious that in Peirce's brief summary of his reading noted in footnote 25, he dismisses the Stoics so quickly.

Their triadic theory of semeiotics is summarized in the diagram below (cf. Covington 2006, p3ff):



This diagram expresses the idea that we can begin our semeiotic interpretative journey with any one of the three sign components. To understand a signification or meaning, we need to know both what object the sign is associated with as well as how the sign is physically represented to us. The linkage between these three components is indispensable to understanding the world around us (see chapter six below for a fuller discussion).

The Stoics are arguably (Robins 1967, p27) the inventors of the concept of grammar as we know it, deriving this from their theory of semeiotics (as it should. See chapter eleven below). The Stoics were perhaps the first to view language as a "natural object." The units of

language that were most important to them were the lection (λεκτον) - a complete sentence, or what Peirce would refer to as a dicisign (see chapter six). An "incomplete lection" was an unsaturated predicate by itself (what Peirce would call a rheme). The "fillers" of the incomplete lecta were known as "subjects" (like Peirce, the Stoics did not at this level of analysis distinguish between subjects vs. objects). These subjects, which Peirce also calls "themes" can themselves also be incomplete lecta/rhemes. Peirce's background in chemistry led him to refer to the number of possible subjects/themes that could attach to an incomplete lection/rheme as the "valency" of the rheme.<sup>9</sup>

For the Stoics (as for Peirce and Frege) a predicate is an incomplete lection (rheme for Peirce, "unsaturated" for Frege), which is completed (i.e. its valency is satisfied, according to Peirce) by a noun, usually in nominative case. Before Frege, Peirce, or any modern logician, the Stoics invented the idea of the a proposition (which they referred to as an "axiom" (ἄξιωμα/ἀξιωμα), but their meaning for this term "proposition," contrasted with the more common Greek usage of "axiom," closer to our modern meaning of axiom, as in geometry, etc.). They commented on grammatical alternations as well, e.g. the passive-active contrast. They also observed that propositions, but not individual words, can be true or false (they failed to notice, as so many do, that discourses can also be true or false independent of the propositions/sentences that they are comprised of).

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<sup>9</sup> And, as we see in chapter eleven, Peirce argued that no rheme could have a valency greater than three - a generalization missed by modern linguistics (at least in the sense that if it is ever noticed, there is no explanation for it).

They further noticed that corresponding to each affirmative proposition there is an interrogative proposition (i.e. they were the first to propose not only propositions but transitivity and mood alternations, though from a superficial perspective). Interestingly, they commented on the fact that complex propositions can have different truth conditions from simple propositions:

It is day. (True or False if it is day time).

If it's day, it's day. (True always)

Again, however, as most did, they failed to notice that this is a property of discourses rather than simple vs. complex propositions (as do many modern linguists). Two propositions can be individually simple and produce the same truth conditions as a complex proposition:

It's day. It's day. (True always when given the reading of the complex proposition above, though without any necessary overt mark of subordination or recursion in syntax/grammar proper. See Everett and Gibson 2019) for a lengthy discussion of this type of confusion in the syntactic literature, as well as chapter eleven below).

They also looked at the compositionality of propositions, i.e. how a proposition's meaning is built from the meaning of its parts. And they saw syntax as a generative, not merely classificatory system.

Our greatest commentary and criticism of the Stoics is found in the work of Sextus Empiricus (c. third century AD); CITE THE LOEB BOOKS, who was overall very critical of the Stoics work.

Yet Chisholm (1941, 371) observes that in spite of his criticisms:

*"It was primarily the Stoics who drove Sextus to the theory of signs...The Stoics had devised their own theory in order to justify their metaphysical speculations and Sextus regarded it as no less pernicious than the speculations themselves."*

And also,

*"Although the Stoic theory of signs is quite dissimilar to contemporary empirical theories, it is of interest to note that some of the Stoics offered a definition of "truth" which is nearly identical with that proposed by Carnap and Tarski. The general rule of truth, according to Carnap, is that a sentence is true if and only if the object designated by the constant (the subject) has the property designated by the predicate. E.g., "A sentence of the form '...n is ... p' is true if and only if the thing designated by '...p' has the property designated by '...p'"<sup>4</sup> (ibid)*

Moreover, Sextus tells us this about the Stoics:

*"As to this definite proposition 'This man is sitting' or 'This man is walking,' they declare it is true when the thing predicated such as 'sitting' or 'walking,' belongs to the object indicated." (ii, 289.)*

As Chisholm (1941, 374) points out "This might be regarded as one of the beginnings of "scientific semantics." He goes on to observe that (p375) that:

*"The Stoics believed that words can be indicative signs and, accordingly, it is possible to make meaningful statements about intelligible molecules, the infinite void, and other such non-empirical Sextus regarded such statements as nonsense. Philosophers ... should not employ indicative signs (metaphysical assertions) and should make no statements which cannot be sense experience. This passage is typical; "Every argument is judged to be either true or false according reference to the thing concerning which it is brought forward... the fact concerning which the argument is brought forward and pre-evident, it is easy to refer the statement to it and then, way, to declare either that the argument is true as confirmatory fact, or false if contradictory. But when the fact is non-evident hidden away from us, then, as there can no longer be any sure of the argument to it, ... disputation springs up, since neither has missed the mark knows that he has missed it, nor he who it knows that he has hit it. Accordingly, the Sceptics very compare those who inquire about things non-evident to men at a mark in the dark."*

On putting signs together (a type of Merge, perhaps, for those who follow Chomsky's (1995) Minimalism), or associating properties with objects, Chisholm (p379) cites Sextus who says "... the act of putting together one thing with another and of perceiving such a sign together with such and such a form, belongs to the rational faculty." (NB: Not to a "grammatical faculty.")

The Stoics influenced Peirce deeply with these and other ideas on language and philosophy. Apart from Peirce, moreover, the Stoics' writings on both semeiotics and linguistics are of foundational importance.

The rivals and contemporaries of the Stoics were the Epicureans, members of a school of philosophy founded by Epicurus (341-270 B.C.E.). Epicureans were almost exclusively interested in ethics.<sup>10</sup> They were unlike Peirce in that they did not connect relating ethics to the larger program of science and investigations of the natural world. In fact, they often denigrated science and mathematics as unworthy of those truly interested in ethics. On the other hand, the Epicureans produced a number of important ideas that influenced Peirce.

One of Peirce's most important doctrines, *tychism* (the idea that absolute chance is an important force throughout the universe), was influenced both by Charles Darwin and by Epicurus, though the primary philosophical idea belongs to Epicurus. Epicurus developed the idea of the "atomic swerve," which is the notion that atoms take unexpected, random changes in their course as they travel through their spaces. This concept of chance at the atomic level was for Epicurus (and for many who were influenced by him) the key to our free will and to the breaking free from determinism (it finds resonance today in those who take similar lessons, however misguided, from quantum mechanics). Based on his readings in evolutionary theory and physics, Peirce came to believe that Epicurus was on to something and that "absolute chance" must be a part of any theory of science or epistemology. Prior to his readings in

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<sup>10</sup> According to the Internet Encyclopedia of Philosophy, as good a source as any for a superficial generalization, Epicurus "taught that the point of all one's actions was to attain pleasure (conceived of as tranquility) for oneself, and that this could be done by limiting one's desires and by banishing the fear of the gods and of death." Although the general public, if it considers Epicurus at all, sees him as the originator of a form of hedonism, the philosophy of the Epicureans was much more sophisticated than that reduction.

evolutionary theory and Epicurus, however, Peirce was a committed "necessitarian" - how the universe is is how it must be (Marquand (1883)).

At the Johns Hopkins University, Peirce advised a single PhD student through to completion, Allan Marquand.<sup>11</sup> Marquand pursued Peirce's interest in Epicurus, writing "The Logic of the Epicureans," which he published in Peirce's edited volume *Studies in Logic: By Members of the Johns Hopkins University*, published in 1883.<sup>12</sup> Marquand's work shows the influence of semeiotics on his understanding of logic and the importance of semeiotics for the Epicureans: "The function of logic consists in inference from the observed to the unobserved. This was called a sign-inference. According to Epicurus there are two methods of making such

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<sup>11</sup> Peirce also advised the thesis research of Dr. Christine Ladd-Franklin, the first woman to study for a PhD in mathematics and symbolic logic. But her PhD was not granted for forty years after she completed the requirements because she was a woman. Her presence at Johns Hopkins was so controversial in fact that one of the trustees resigned from the university due to her presence. She was a confidant and interlocutor for Peirce for the rest of his life, even though she found him extremely eccentric.

<sup>12</sup> Following his PhD Marquand in 1881 applied for a position at Princeton University. The president of Princeton, James McCosh (1811-1894) hired him. McCosh did not think Marquand's work in logic was compatible with Calvinism, but because of Marquand's father's connections, rather than refuse to hire Marquand, he hired him as an art history instructor. He became one of the founders of this field, only the second to be hired in this area, and excelled at this for the remainder of his career.

an inference; one resulting in a single explanation, the other in many explanations." (Marquand (1883, p4), i.e. an unambiguous interpretation and a vague or ambiguous interpretation).

Epicurus was an empiricist, an early semeiotician, and a believer in chance as a crucial force in the universe. These were very important ideas for Peirce also and influenced him strongly. As a result, Epicurean influence on Peirce took precedence over that of the Stoics.

As we are seeing here, although Peirce is responsible for launching the first original European-American program in philosophy, Pragmatism, he did not developed this in a vacume. Although a full account of Peirce's role in American philosophy must wait for a future work (Everett in progress) the discussion of this chapter attempts to show the major influences.

With this all-too-superficial survey of the influence of Greek philosophy on Peirce's thoughts about language and philosophy more generally, we now move to consider the influences of European pre-modern philosophers of the English-speaking world.

Max Fisch summarizes the importance of these philosophers clearly:

*"Peirce's most characteristic theories - pragmatism, tychism, synechism, and agapism - may be traced to two early commitments and two early antagonisms, the combination of which in one mind is probably unique.. He was committed almost from the beginning of his career to the methodology of the exact experimental sciences and to a scholastic realism derived from Duns Scotus. He was opposed to the rationalism of Descartes and to the nominalism and individualism of the British empiricists."* (Fisch (1986, p2))

There were three more salient influences on the development of Peirce's thought, important for a Peircean linguistics that I wish to discuss here, namely, the Scholastics, The Modistae, and the Commensensists. We take up each of these in order.

Back in the eighth century, the new Emperor of the Holy Roman Empire, "Big Charles" (Charles le Magne; Charlemagne; Karl der Große, Carolus Magnus) (747-814 C.E.), ruled the day. Whatever else Karl/Carolus did, one of his indisputably great contributions to Europe and the world was his emphasis on education, in particular his requirement of 787 C.E. that every abbey in his kingdom have a school. This emphasis on schools was referred to as scholasticism. But what emerged from scholasticism was much more than mere elementary or even church education. Great intellectuals of Western history, such as Thomas Aquinas (1225-1274), Duns Scotus (1265-1308), William of Ockham (1287-1347), among many others, emerged from these policies (long after Charles had died) and following this Scholastic tradition were supported and allowed to rediscover and expand the insights of the Greek intellectuals of the era of Plato and Aristotle.

Since the schools were abbey-housed and church-controlled, the principal scholars brought into this vast educational system were priests, especially those of the Franciscan and Dominican orders (many priests of these orders, along with priests of the Jesuit order, I have had the pleasure of meeting in my decades in the Amazon, as these orders still serve the church as missionaries, teachers, and administrators, among other duties). The Franciscans (e.g. Duns Scotus and William of Ockham) and Dominicans (e.g. Thomas Aquinas) not only brought back to relevance and explored the literature of the Greeks we have been discussing in this chapter, but they also founded universities, the first in the world. They were initially active in Italy (oldest university in the world at Bologna (founded 1088 CE)), in France (1150 CE - the third university

founded in the world), in England (Oxford 1096, second-oldest university in the world), in Spain (Salamanca, 1218 CE), and Portugal (University of Coimbra, 1290 CE). Scholastic movements are still active in some places, such as Analytical Thomism and scholastic-analytic philosophical fusion among some philosophers.

Whereas the Franciscans focused on Plato (while also expounding Aristotle's ideas), the Dominicans made more use of the writings of Aristotle. Although Peirce was more influenced by Aristotle, ironically the most influential schoolmen for his philosophy were Franciscans, in particular Duns Scotus and William of Ockham.

The Scholastics emphasized dialectical reasoning and inference as tools of logical truth-seeking. Likewise Peirce admired Plato's dialogues and later in his career wrote his own dialogues (REFERENCE???). These Scholastic methods were applied to various fields of study, bringing more intellectuals and schoolmen under the influence of the Scholastics.

In an extremely interesting and helpful monograph, Cárdenas (2018, p7) argues that:

*"Peirce's Scholastic is, above any of Peirce's other brilliant contributions, the most important doctrine and gives organic unity to the different stages of his development as a philosopher; and a key to our understanding his pragmatist philosophy."*

Among Cardenas's claims is the idea that Peirce's science and phenomenology as well as many other of his theories, are heavily influenced by or even derive from the Realism of the Scholastic writers (though not all were realists. For example William of Ockham, whom Peirce cites frequently, was a nominalist).

Prior to the Scholastics the principal choice in thinking about the nature of the world and our experiences was between Plato and Aristotle. For Plato, what is real are "perfect forms," entities in heaven as he conceived of it that are the models for the things we see on earth. For Aristotle forms are seen in their instantiations. There is no need for a separate entity or plane of existence. Though Aristotle's ideas in particular influenced Peirce, they are still a ways from what he settled on through the influence of the Scholastic form of Realism .

Plato's realism was *extra rem* ("outside the matter") or *ante rem* ("before the matter") - a realism in which universals exists apart from the objects that we detect them from. This is quite different from Aristotle's *in re* realism, which viewed universals as manifest in actual objects.

Again, although Plato and Aristotle in different ways provoked Peirce to consider new aspects of the nature of science and human inquiry, another philosopher became even more important to his efforts. In particular, Peirce was influenced by Duns Scotus's view of *in re* realism. Before discussing realism in depth, it is worth observing that there are a couple of versions of *in re* realism on offer in the philosophical literature. One type, discussed by the Scholastics, originated with Aristotle, where the idea was put forward that there was no heaven of "real things" as Plato would have it, but rather, that universals are instead seen, not in separate universal forms, but in the very particulars that instantiate them. Apart from those instantiations, there is nothing else.

Peirce's view, no surprise here, was more nuanced. As we see in later chapters, Peirce distinguished between the real and the existing. Something can be real without existing. (For linguists this would apply to, inter alia, phonemes and Chomskyan "deep structure" as originally proposed). Anything that is the object of a sign is real. But if it is not in the world, it does not exist. This applies to universals, to abstractions, to God. All are real. None necessarily exist. It is

a uni-directional implication: *Exist* --> *Real* but not *Real* --> *Exist*. In other words, for Peirce universals are real. Abstract categories are real. He is a full-blown Realist. Their existence is a separate matter.

In Peirce's phenomenology realism is the basis for secondness. A thing is perceived as a separate entity as an individual when it can be opposed to something else. If I see a one-hundred pound barbell for the first time, I have a tone-impression of it, an experience of firstness. But when I go to pick it up, its resistance to my muscles signals that it is there, it is real. This resistance is its secondness. When I think about the properties that all weights share or how one hundred pounds can be feathers, barbells or dollar bills, then I am generalizing about, perceiving via generalization, the thirdness of weights. None of this phaneroscopic perception would be possible if the world were not considered real. There is a reality out there and my thinking and yours make no sense without it. As Peirce might say. A linguist doing field research is discovering real things, facts, (even though they might be misanalyzing what they are seeing), not merely ideas.

To further the understanding of the particular vs. the universal, Scotus discussed the concept of haecceity - individuation, what makes this cup THIS cup or me ME. As Scotus puts it (as expounded by Cardenas 2018, p23):

*"Existence is a result of individuation, and presupposes that whatever exists, does so as an individual entity and, thus, another tacit principle of reasoning comes into play: 'What presupposes the determination and destruction of another is not the reason for distinguishing or determining the other.'* (Ord. II 3.1.3.62 - Scotus)."

Thinking of practical examples imagine you alive vs. you dead. Your dead body, at least immediately after death, can be presumed (perhaps incorrectly) to weigh just what it weighed at the moment of death. If this is correct, then what gives you your haecceity, what makes you you, is not the matter you are composed of (you cannot argue that your body is you, because your body can no longer do any of the things or manifest any of the emotions, intelligence, etc. that made you YOU).

Now this gets us to the idea of universals (not quite yet universals in linguistics, but we shall get there). According to Scotus (as described by Cardenas) "Universals are never individual entities; they are common properties." In Peircean terms (as we see in Chapter Four) this means that individuals are seconds and universals are thirds. Thus Peirce derives not only seconds but also thirds from Scholastic Realism, two crucial components of his theory of phenomenology. Firsts are our vague perceptions. You are walking in a dark alley and you sense something there, either based on past experience or a sign that you perceived by did not individuate. You might leave on this basis. Or you might continue. But if you actually see someone in the dark, you have experience a secondness. They are perceived against a background and thus their form "resists" the forms of the background. If you can see that this entity is a "thief" you are perceiving a generalization, i.e. a thirdness.

As we see in chapter \_\_\_ this is a good synopsis of how linguistics field research works. Exclusive phenomenology of firstness comes to co-exist with secondness and, eventually, thirdness. (Our field research concludes, if successful, in thirdness.)

Now, let's turn to consider briefly what a linguistic universal is. They all lack haecceity. They are not specifics, they are generals. To begin a discussion of linguistic universals in light of the philosophy of realism, let's consider a short range of the variety of meanings linguists often

attach to the idea of a universal. Over the years linguists have made any number of claims for universals. Many of these claims are interesting and without problems. But often linguists make two types of mistakes in proposing universal. The first type of mistake is logical. The second is lack of pragmatic clarity - how to test the reality of the universal.

The logical type of mistake is easy to see when, as is quite common, linguistic universals are represented as conditionals. If one is not careful with conditionals, they can turn out to be entirely spurious. For example, it is a universal fact that if a language has nasal vowels (e.g. French and Portuguese) then it will also have oral vowels.<sup>13</sup> So one might think of stating a universal like this:

*Nasal vowels --> Oral Vowels*

But the problem here is obvious. All languages have oral vowels. This means that the apodosis is always true. Yet from first-year logic class we know that if the apodosis is always true, the truth of the protasis is irrelevant. This "universal" holds without exception, not because it tells us anything valuable about language, but simply because of its structure - it contains an always true apodosis. We can dispense with any so-called linguistic universal that takes this form (many do). We could as easily say "If it is Tuesday --> the language has oral vowels," etc. The protasis adds nothing to the truth value of the conditional in this case. There is no "universal" here.

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<sup>13</sup> The air to make a vowel generally originates in the lungs and exits the body through the mouth. If it exits exclusively through the mouth it is an oral vowel. If the vowel air exits through the mouth and the nose, it is a nasal vowel.

But what about a more controversial universal statement, e.g. "syntactic recursion is a prerequisite for the emergence of language(s)." This is the claim of Hauser, Chomsky, and Fitch (2002). More precisely, they claim that recursion is the sole member of the FLN (Narrow Faculty of Language): "We hypothesize that FLN only includes recursion and is the only uniquely human component of the faculty of language." Now, in Everett (2005) I argued that the Piraha language lacks recursive sentential syntax (though I acknowledged that the Pirahas think recursively).

Since the publication of Everett (2005) reactions to the claim that Piraha lacks recursive, sentential syntax, thus violating (for some) the universal that all languages are built on an FLN that contains only recursion (no one has made the claim that there is a language outside the scope of the FLN) have taken various forms one of which is: Whether or not a specific language displays recursion is irrelevant to the claim that the FLN is recursion.

Setting aside for now the lesson of chapter six, namely, that all languages *do* have recursion just not of the sentential or syntactic kind but of the Peircean semeiotic kind, let's just consider the FLN claim logically in order to determine whether it has any empirical content, i.e. whether it makes a prediction. Piraha is crucial to demonstrating that the FLN is vacuous, predicting nothing.

This type of universal can be tested by asking if it can be counterexemplified. If not, it is vacuous. It turns out that if the FLN statement as given in Hauser, Chomsky, and Fitch is presented as a conditional it is vacuous, just as the nasal/oral "universal." But if it is instead presented as a universal quantification, it is not vacuous, but false. Those are the only two options for it to be taken as an empirical claim.

To see this, first recall that if the apodosis (consequent) is true, the protasis (the condition) can be true or false, but the sentence will always be true.

In this light, let us present the claim that recursion underlies human language as a conditional:

Humans have language --> Humans think recursively.

If humans have language, then they think recursively.

Though this is simple to state it is unhelpful, because all healthy humans think recursively. Thus the apodosis is always true. Therefore, the conditional is always true, regardless if humans have language or not. Another tack:

*Humans think recursively --> Humans have language.*

How about this alternative? "If humans think recursively, then they have language."

But all healthy humans have language, so the conditional is always true because consequent always true. Once again the conditional is vacuous.

*Humans do not think recursively --> Humans do not have language.*

We could experiment with the negative statement just given. In normal sentence structure, "If humans do not think recursively, then they have no language." This is a slightly different structure - both the conditional and the consequent are false. But to the first-year logic student this means that the statement above is unhelpful because it is *always true* (i.e. in the formula  $p \rightarrow q$  if both p and q are false then the statement is true.

Therefore, a conditional statement of recursion as the FLN is no more helpful than other more obviously unhelpful conditionals, e.g. "If humans have one head, they have language" (always true); "If healthy humans have no mouth, they have language" (always true); or even: "If humans lack recursion, they have language" (always true).

It seems that in order to get any information of value out of the FLN = recursion claim, one would have to formulate a hypothesis that is not trivially true. One way to do this is to

propose alternatives, e.g. the universal quantifier: "All languages have recursion" ( $\forall x, x$  a language,  $x$  has recursion). That would be a testable claim. But it *has* been tested. Piraha does not have this type of recursion. Therefore Piraha shows it to be false. There is therefore no universal, valid empirical claim of this type.

Another formulation might work. But the point is that the manner in which a universal is stated is vital to the evaluation of that universal. Peirce never erred in his care with universals and neither did the Scholastics. As it stands, since Chomsky and his followers have, subsequent to my Piraha data, made the claim that they do NOT predict that all languages will have recursion, they must have in mind something like the above conditional, repeated here: If humans have language, they think recursively. But, as we have seen, since all humans think recursively (this is a hypothesis in itself of course, but I will assume it for the purpose of illustration), the conditional adds nothing to the statement because the apodosis is always true. And because this means that the whole statement is always and necessarily true, it adds nothing to our understanding of the human capacity for language, merely restating that humans do have that capacity, which we knew to begin with. Like the nasal vs. oral "universal" the idea of recursion as the FLN of language makes no empirical claim and can be abandoned without consequences for any theory.

On the other hand there are universal claims one could imagine that in fact could be tested, e.g.: All languages require brains with at least 1.5mb of memory available for language (Piantadosi ()); All languages have symbols (Peirce). These are testable.

Jumping ahead for a moment, the recursion/FLN claim's obscurity is a perfect example of Peirce's "How to Make Our Ideas Clear" (discussed chapter four). The only way to move the recursion = FLN hypothesis beyond the noninformative is to say not only what it would take to

falsify your hypothesis but also *what does your hypothesis do?* How does it account for the facts (and what are those facts?) better than other hypotheses? The recursion, Piraha, FLN debate is a nearly two-decade old issue in linguistics that would matter not at all in a Peircean linguistics because there is neither logical nor empirical content to the claim. This is an indictment of non-Peircean linguistics (also non-model theoretic linguistics) and points to the need for a more solid theoretical basis that non-Pragmatist, non-inferential linguistics theories all face.

However interesting one might find this discussion so far, it ironically still isn't quite the problem with universals addressed by the Scholastic Realists. They were concerned with where and in what way the universals are found - do they exist? Are they real? Are they real and have existence? Are they in re or ante rem? Are they ideals or reals?

For Peirce, unlike for Aristotle, a universal is real (only) and it is manifest in various ways, not always the same way. The redness of blood need not exactly match the redness of a tomato in order for both to serve as exemplars of redness, with their individual haecceities, to be manifestations, allophenoms, of the universal of redness.

I suggest that linguistics has a fine example to help us understand Realism more clearly. Linguists can appeal to the phenomenon of "allophonic" or "complementary distribution." Philosophers, including Peirce, have missed this simple analogy, a simple phonological process that seems designed to illustrate Peirce's concept of universals. Not everyone can be a linguist unfortunately.

Perhaps the most most basic abstract (and arguably universal for a limited community, depending on your understanding of "universal") object of linguistics is the *phoneme*.<sup>14</sup> A phoneme is in a sense a Scholastic Realist's universal - it is the sound that all speakers think they hear and say but that no one actually says or hears. Consider for example the English pair of words 'peer' [p<sup>h</sup>i:ɹ] and 'spear' [spi:ɹ]. The "universal" sound, the phoneme, of /p/ is not in fact the same sound represented orthographically the same 'p' in both words. One 'p' [p<sup>h</sup>] is aspirated, i.e. a small puff of air is ejected from the mouth when the 'p' is pronounced.<sup>15</sup> The other 'p' [p] has no puff of air. The phoneme/universal/abstract item /p/ thus has two local instantiations with their particular haecceities, with the aspirated version in syllable-initial position and the non-aspirated version in non-syllable-initial position. That is, the allophone represents/is the haecceity of the sound, its secondness. The allophone of a phoneme is a token of the abstract/universal sound

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<sup>14</sup> Some theories claim to have done away with phonemes, e.g. Lexical Phonology (Mohanan ()); Kiparsky ()) but very few linguists overall believe that this reduction was accomplished. In any case, what was proposed in its place was an even more abstract "lexical level", so that abstraction is inescapable in either phonology or in linguistics more generally. Chomsky's old ideas of "deep" vs. "surface" structures were both abstractions, "surface structures" being no more concrete than "deep structures" (see Chomsky 1965).

<sup>15</sup> In standard linguistic notation, brackets enclose the "allophone" ("[]") the concrete pronunciation of a perceived phoneme in a specific sound context. The diagonal slashes, "/" represent the abstract or universally perceived (but unheard) sound, the thirdness, the phoneme).

type. This phoneme is then a real but non-existent abstract entity that is instantiated as an allophone.<sup>16</sup>

There are thus various potential problems with universals but solved by the Scholastic-inspired Peircean solution. Here I have argued that the phoneme - taken for granted by nearly all linguists - illustrates Peirce's solution quite well - it makes the idea clear.<sup>17</sup>

And now we get to the real core of why universals are so important to Peirce (a point that will be reinforced with each subsequent chapter) - they represent the dividing line between Nominalism (of any variant) and Realism (of any variant). If a universal to you is a *façon de parler*, you are a Nominalist. If a universal is real (not necessarily exists) you are a Realist. A universal is pure thirdness.

Now though Duns Scotus, one of Peirce's most admired predecessors, was a realist, another Scholastic, William of Ockham was a nominalist. What is the difference? Why were these issues so important to Peirce? Why should Nominalism precede Realism epistemologically? Why are the Pirahas (Appendix One) Nominalists? Why should Peirce care about whether universals are real or ideals?

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<sup>16</sup> Translating to Peirce's phenomenology: Phoneme = thirdness (type); allophone = secondness (token); phone = firstness (tone) (see chapter twelve for more details).

<sup>17</sup> Peirce's influence among linguists has been minimal and I doubt that the proposal of the phoneme was Peirce-inspired. Certainly it was not judging by over references by the developers of the idea. Wikipedia and Anderson () recognize the generally-accepted opinion that the term *phoneme* as an abstraction was developed by the Polish linguist Jan Baudouin de Courtenay and his student Mikołaj Kruszewski during 1875–1895.

There is much of importance riding on linguists' conceptions of what one is doing when proposing an abstract analysis or a universal. If the abstraction is considered an idea, but neither necessarily real nor existent, then the idea is nominalist and anti-scientific according to Peirce. If an abstraction or universal is considered real, then the author or reader is a realist. And the difference according to Peirce (SOURCE) is nothing less than whether one is a scientist or a speculator, whether one's ideas can be tested and move us forward in our asymptotic trip to the truth. I suspect that most linguists are realists, because they see themselves unapologetically pursuing truth, not merely ideas. Peirce put it this way:

*"The question ... is whether man, horse, and other names of natural classes correspond with anything which all men, or all horses, really have in common; independent of our thoughts, or whether these classes are constituted simply by a likeness in the way in which our minds are affected by individual objects which have in themselves no resemblance..." (8.12; 1871).*

In other words, are our "findings" products of our minds alone or is there a correspondence to the world (yes, Peirce defended a "correspondence" theory of truth). Peirce's main attraction to Realism is that it is the only philosophy that can provide a foundation for scientific understanding of the world around us. Peirce came to see Nominalism as a pernicious force, even in the practice and theory of medicine (1.109 c. 1896).

Peirce regularly points out the negative consequences of adopting a Nominalist philosophy. For example, consider his criticism of "higher criticism:"

*"German "higher criticism" of history in general and above all of ancient history, although it has of late withdrawn from many of its most extravagant positions, is still marked by a strong disposition to discredit all the testimony which alone can give us any information about that history, in favour of what the modern German conceives to be likely. Thus, we were told that if there ever were any kings in Rome, all that has come down about them is mythical; that there never was any such poet as Homer, far less any such city as Troy, or any such state of Greek society as is described in the Iliad and Odyssey; that only a minority of the dialogues of Plato are genuine; that the writings attributed to Aristotle were gradually composed in the Peripatetic school; that Manetho's account of Egyptian history is ridiculous, etc., etc. But during our day, a great deal of excavation and of highly scientific archaeological work has been done; and none has ever been done without restoring the credit of the ancient writings. One of the most recent examples of how these German critics have infected the world with their bad judgement is to be found in a work only a few years old by the most scientific living archaeologist, I mean Mr, Flinders Petrie's History of Egypt. In this work he treats the first three of Manetho's Egyptian dynasties as altogether mythical, notwithstanding the uniform confirmation of Manetho's testimony. A few years later, it [was] Mr. Petrie himself who discovered monuments of Menes himself, Manetho's first king" (Peirce SOURCE)*

The interest in human language goes deep into human history. In pre-modern times Plato and Aristotle thought long and hard about the nature of human language, founding a Western perspective. Pāṇini developed an alternative theory of grammar - based on actual analysis - in

India in the fourth century B.C.E. His grammar of Sanskrit, roughly contemporaneous with Plato's work founded an Indian perspective, along with the entire field of Sanskrit studies. But one of the earlier more complete theories of the nature of human language emerges from the Modists/Modistae, beginning in the thirteenth century C.E. and culminating in the fourteenth-century treatise, *De Modis Significandi, Seu, Gramatica Speculativa*.

Originally thought to be a work of Duns Scotus, and so credited by Peirce in his references to it, this important treatise in the Western history of grammatical studies and linguistic philosophy turned out to have been written instead by a mysterious man named Thomas (Godfrey 1960, 22, among many others). About all that is known about Thomas is that he taught at the University of Erfurt (founded in 1379), Germany. Thus he is known to us simply as Thomas of Erfurt. Erfurt's speculative grammar ("speculative" refers to clear-seeing, as in "spectacles" used for eyeglasses) broke genuinely new ground in grammatical studies generally, as well as in the development of semeiotic theory.

Although Erfurt's work was influential, the people following a similar approach to grammar were found in various parts of Europe at this time, especially at the University of Paris. The "Modistae," as they became known largely through Erfurt's work and their focus on analysis of the different modes (indicative, interrogative, etc.) of grammatical constructions and what these mean for our understanding of Universal Grammar, a term first used by the Modistae.

The Modistae, like most modern language scientists (linguists, psychologists, neuroscientists, computer scientists, etc.), tried to sort out the universal elements of grammars (those expected to be found in all human languages) from the contingent elements, those that vary - such as the contingent lexical forms of each individual language vs. the concepts that the words signify (as some believe). In this essay I argue that in a Peircean linguistics there are no

necessary components of grammar per se, that grammars are contingent constructions constrained by more general principles of semeiotics and logic. The Modistae were the first to point in this direction.

The Modistae believed that the sounds of language were non-essential to language. There was only one grammar in their theory, the "grammar of the intellect" (Godfrey 1960). Since the processes of the intellect were, ex hypothesi, the same for all humans, Universal Grammar is a cognitive-based, non-autonomous grammar for the Modistae. As Godfrey (1960, 24) puts it "Thomas's reliance on logic for a solution to language problems reflects the general interest in this subject in the schools of the thirteenth century." Peircean linguistics also relies on logic as expressed in part through semeiotic principles to constrain grammars (see Everett ()) and below).

Another crucial component of the Modistae's theory of grammar was that grammar was discovered and expressed through "congruous discourse," a point that we return to in chapter \_\_, where it is argued that discourse (monologic or dialogic) is the apex of grammar and that all manifestations of grammatical units cross-linguistically must be evaluated in terms of their discourse roles and varying forms.

The reason for the focus on discourse then and now is that (Godfrey 1960, 24) "Meaningful discourse presupposes understanding and, particularly, an understanding of the significance of the specific sounds employed." Erfurt's work further recognizes words as signs, signs by which "the human understanding expresses or signifies with the aid of phonetic materials a delimited being." This is approaching the modern understanding of signs, though not quite there. The Modistae were concerned with sentences as constituents of discourses and *pars orationis*, parts of speech or a "particular act of signifying," as constituents of sentences (though discourse constrain all). For example, will words like *grief*, *grieving*, *grieve*, and *grieved*, all

share the same meaning in some sense, they form different signs to communicate different *modi significandi*. If we look more carefully at Erfurt's theory, we see similarities to Peirce's much-later ideas.

For Erfurt a sign had three components - its expression (physical representation), its concept (mental content), and its material content (roughly corresponding to Peirce's idea of the object). If this analysis is not far off, Erfurt thus anticipates a good deal of Peircean semeiotics and can be considered at least incipiently ternary/triadic. As Godfrey further points out, Thomas's triadic view of signs in Erfurt (following the Pythagorean tradition at one level) differs from the later, dyadic theories of both Saussure and Louis Hjelmslev (1899-1965).<sup>18</sup>

As important as the Modistae were for Peirce's thinking about Universal/Speculative Grammar, Universal/Speculative Rhetoric, and Methodeutic/Critical Logic, European thought about language and the mind did not stop with them. When we arrive in the early eighteenth century we discover new and powerful philosophies about human ideas and thinking that further fed into Peirce's thinking and American Pragmatism more generally. Two of the main thinkers of this period, were Thomas Reid (1710-1796) and David Hume (1711-1776). We look first at

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<sup>18</sup> Martin Heidegger's (1889-1976) later (1916) work on the connection between the categories of the Modistae and phenomenology is an interesting application, though suffers because he was unaware of Peirce's work on phenomenology which, years before Heidegger wrote on the subject, had worked out an intricate and interesting theory of exactly this set of relationships.

Reid's work in the tradition of the Scottish Enlightenment. Reid was a principal developer of "Common-sensism" "The Philosophy of Common Sense," as seen in statements like:

*"Every man feels that perception gives him an invincible belief of the existence of that which he perceives; and that this belief is not the effect of reasoning, but the immediate consequence of perception. When philosophers have wearied themselves and their readers with their speculations upon this subject, they can neither strengthen this belief, nor weaken it; nor can they shew how it is produced. It puts the philosopher and the peasant upon a level; and neither of them can give any other reason for believing his senses, than that he finds it impossible for him to do otherwise." (Reid \_\_\_\_)*

All reasoning needs to begin somewhere. Different philosophers propose different starting points. One of the most famous such beginnings was urged by René Descartes (1596-1650), who asked us to begin by doubting *everything* except our own existence. In chapter four below we see that Peirce rejected entirely this (what he considered to be) sophistry, the naive idea that we can induce doubt at will. If Peirce is right and Descartes's starting point is spurious, then we must search for a better foundation for human reasoning than artificial Cartesian doubt.

Thomas Reid proposed an alternative beginning for all reasoning, Common-sense, a form of nativism. Reid's cognitive nativism argued that human instincts about the world were largely true and that they formed what had come to be known as "common sense," the latter giving the name to this philosophy. This view of human reason means that at some level our reasoning follows or is based on instincts or intuitions. Although this view is refuted point-by-point by Peirce, it nonetheless remains popular in philosophy and psychology. One such example from

psychology is found in the theory of Sigmund Freud (1856-1939).<sup>19</sup> In a famous quote Freud asserts that:

*"When making a decision of minor importance, I have always found it advantageous to consider all the pros and cons. In vital matters, however, such as the choice of a mate or a profession, the decision should come from the unconscious, from somewhere within ourselves. In the important decisions of personal life, we should be governed, I think, by the deep inner needs of our nature."* Sigmund Freud

One immediate problem with Common-sensism (for Peirce in particular) is that church doctrine was included in the set of ideas given to us instinctually/common-sensically. In addition to innate concepts and ideas, Reid and other Common-Sensers believed in common-sense (innate) inferences as well. As Peirce (1905, 485) put it:

*"The Scotch Philosophers recognized that the original beliefs, and the same thing is at least equally true of the of the acritical inferences [Peirce's label for instinctual/common-sense inferences, DLE], were of the general nature of instincts."*

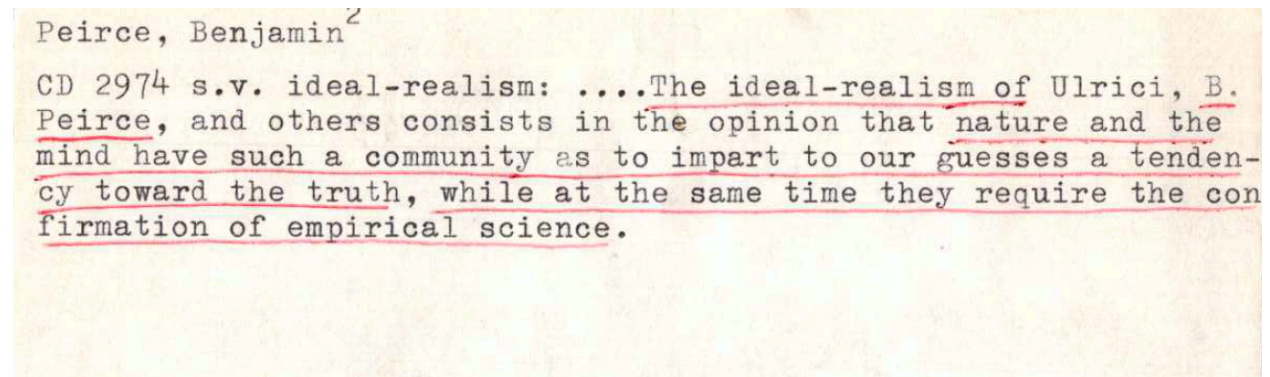
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<sup>19</sup> Freud died just a few months after Edward Sapir (1884-1939) and was seventeen years younger than Peirce, who was his near-contemporary, for those who are interested in history.

Peirce (ibid) goes on to say about instincts: "But little as we know of instincts, even now, we are much better acquainted with them than were men of the XVIIIth century. We know, for example, that they can be modified in a very short time." Peirce believes in the power of instincts in some cases, but he believes they only work for a "primitive" culture (i.e. something still similar to the original evolutionary forces leading to the instincts).<sup>20</sup> Instincts, according to

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Peirce, Benjamin<sup>2</sup>  
CD 2974 s.v. ideal-realism: ....The ideal-realism of Ulrici, B. Peirce, and others consists in the opinion that nature and the mind have such a community as to impart to our guesses a tendency toward the truth, while at the same time they require the confirmation of empirical science.

This sounds superficially similar to some ideas of Evolutionary Psychology (). However, neither Common-Sensism nor Peirce's view of "instincts" should be confused with that particular theory. The philosophy of Common-Sense does have similarities with EvoPsy. But it is less specific about the interactions and inventory of the original ideas that EvoPsy addresses frequently. Peirce's view of "instincts" is entirely dissimilar. Peirce's idea of "instinct" just as his view "Common Sense" is deeply skeptical and fits most appropriately a view of culture as the original source of what are often called instincts. Like Hume, though Peirce uses the term "instinct" one should not interpret the meaning he intended anachronistically, by what we mean today, but rather according to the context of the day in which "instinct" could have either its modern meaning of a innately given concepts, etc. or

Peirce (and thus all of Reid's "common sense" ideas and inference) are often wrong and should always be doubted and tested, contrary to Freud, Descartes, Chomsky, and all others who believe that humans have some privileged, non-inferential access to truth. Peirce insisted that it is healthier empirically to *doubt* our common sense, rather to follow it. We explore this in more detail in chapter \_\_\_ below.

Peirce believes that we should begin where we are in our beliefs, culture, and local situation (Some Capacities - CITE). No artificially created beginning point of "doubting all" can or should be desired. Just start thinking and then use inference and knowledge to check everything, modifying as you go. This is how children learn. How adults learn. How animals learn. Inference (deduction, induction, abduction) in conjunction with knowledge (however insecure either might be) are the only sources of the growth of reason in the universe in Peircean philosophy.

Peirce claims that it would be consistent with Scottish Common-sensism to list *all* of our original beliefs. This is clearly not a view that is shared by Peirce's alternative view, "Critical Common-sensism" which places a priority on leaving no assumption unchallenged *eventually*. We start from what we know, our common-sense or whatever we call it, and we question this as needed based on our experiences and inferences from this beginning-point. (Peirce 1905).

Peirce asks (1905, 486ff) how we could tell the difference between "instinctual beliefs" and cultural beliefs, arguing that we must question "the jurisdiction of original belief." He further

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just unconscious/very quick inference, based on our "occult nature" or what Everett (2016) refers to as "Dark Matter of the Mind."

(p491) claims that "the Critical Common-sensist holds that there is less danger to heuristic science in believing too little than in believing too much."<sup>21</sup>

Ultimately, Peirce's own Critical Common-sensism does not embrace or even arise indirectly from Scottish Common-sensism. The former says that we start our process of reasoning where we are, whether we call that beginning point "instinctual" (whatever we mean by that), or not, but with universal, innate ideas that are conscious (at least in principle). But for Peirce, we have no intuitions nor any "original ideas" or any "first cognitions" independent of inference. Reid rejected this view because he believed that if there is no original first cognition then we are forced into an infinite regress and unable to find any starting point for any of our cognition. This is of course similar to the argument for God, based on looking for the "first cause." God ends the causal regress. But artificially. But, as we see, Peircean semeiotics offers a first start that begins not with innate cognition but with innate powers of perception and the use of indexes, e.g. pointing at a saber-toothed cat. Contiguity in Hume's sense, from there reasoning via inference to other cognitions. Every cognition is preceded by another cognition, but (indexes and icons) may be preceded by symbols (whose objects are cognitively general) and thus precede reasoning, or cognition in the Reidian and Peircean senses.

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<sup>21</sup> This is similar to the conclusion of Everett (2016) in which I argue that evolution seems to have removed rather than enriched human instinctual common sense, including building linguistic structures, in order to provide humans with greater freedom to develop new forms, new ideas, and so on. This is similar to some periods of art history in the West in which old constraints in poetry, in painting, and other forms of artistic expression were abandoned in favor of freer expressions.

A linguist who believed that there is a "language instinct," therefore, would find Thomas Reid's Common-sensism far more congenial than Peirce's Critical Common-sensism. Because for Peirce, although children might/might not have predispositions to learn certain things, these predispositions must be proposed and investigated and they must be, in principle, conscious. And, above all, any learning must involve inference (see the discussion on Inferentialism in chapter \_\_\_\_). Further, because instincts in Peirce's view change quickly, they are not immutable and so the idea of a tens-of-thousands (or millions, Everett 2017) of years old language instinct that has been invariant across time and across all populations of Homo sapiens simply makes no sense. As I discussed in Everett (2012), evolutionary pressures would lead to local changes in "instincts" across human populations. Therefore, if there were a language instinct, it would predict the opposite of what is commonly claimed for it. That is, rather than predicting that all humans can learn all languages, with different instincts evolving quickly in different populations (in Peirce's terms), a language instinct would predict that *not* all humans can learn all languages. On the other hand, an inference-based semeiotic approach makes the clear prediction that all humans can learn any human language because there is no language instinct, not because there is one.

Peirce was not shy in his assessment of Common-sensism: "I cannot admit that judgments of common sense should have the slightest weight in scientific logic, whose duty it is to criticize common sense and correct it."(Peirce, 1903 Harvard lectures, in Turrissi, p175)

Common-sensism, like Cartesianism, seeks a beginning point for reason that appeals more to magic (things unseen and unexplained) as a starting point, whereas Peirce argues that the beginning point for our reasoning is found in non-symbolic signs, indexes and icons, in a way that I find reminiscent of David Hume's perspective.

David Hume (1711-1776) was a contemporary of Reid. But Hume's conclusions about human reasoning and rationality are radically opposed to the very idea of innate, original ideas. Ironically, however, Hume's idealism served as the main inspiration for Immanuel Kant's (1724-1804) radically nativist theory of mind.

Hume's first major work, and always his most important, was his *Treatise of Human Nature* (1739-1740), which he intended to serve as an anthropological theory as scientific as Isaac Newton's (1624-1726/7) *Philosophiae Naturalis Principia Mathematica* of 1687. As we just saw, Hume, very much unlike Reid, and the other Common-sensists of the Scottish Enlightenment, opposed the concept of native ideas. For Hume, rather, knowledge derives solely from experience. Hume thus developed important and influential early ideas on Empiricism, Scepticism, and Naturalism, furthering ideas of his predecessors Francis Bacon (1561-1626), Thomas Hobbes (1588-1679), John Locke (1632-1704), and George Berkeley (1685-1753).

Very controversially, Hume also rejected the ideas of induction and causality in human reasoning as illogical or irrational. These terms refer merely to habits (ironically for Peirce this is no pejorative term, since all learning is via habits in his sense). Inductive reasoning according to Hume is roughly doing the same thing over and over and getting roughly the same results. But at any moment, if we continue long enough, we will get exceptions - showing induction to be too porous to serve as effective reasoning (objections to induction are taken up again in chapter \_\_\_ below, where we discuss Nelson Goodman's slightly more nuanced objections). Our minds impose causality, for example, on certain events or entities that we regularly perceive as an ordered pair - rabbit runs-dog chases; gun fires-deer falls; batter swings-ball changes course and soars away.

Hume argued from his conclusions that humans' principle force for determining thought and actions is not rationality but *passion*. Our passions govern us. Our concept of induction, for example, presents us with regularities that our passions lead us to understand in one way rather than another.

Hume thus reasoned that just because a particular fact is observed in the world, this does not justify us rationally to say that things "ought" to be this way. In discussing this issue Hume was the first to discuss the so-called "is-ought" problem, i.e. what *is* can never be made into an *ought* (Hilary Putnam and others refer to this or something almost identical as the "fact-value dichotomy").<sup>22</sup>

One statement of Hume's that was later to inspire Kant's work was his statement that "the self is nothing more than a bundle of perceptions."<sup>23</sup> From this Kant proposed mental categories projected onto the world, shaping our perceptions of the world. And from Kant Peirce in turn produced his *phaneroscopy*, the theory of categories that underlie our perceptions and generalizations or rational processes - firstness, secondness, and thirdness.

As Kant says, Hume's work

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<sup>22</sup> The scope of application of the fact-value dichotomy can vary from that of the is-ought problem, according to \_\_\_, in allowing for a relationship between aesthetics and ethics. Peirce argued strongly for such a relationship, namely, that aesthetics constrains ethics (see \_\_\_ below).

<sup>23</sup> But Hume leaves out something crucial here - the memory that binds our perceptions together. In Everett (2016) I argued that, as Hume claims, self is perceptions, but with memory a crucial component - a memory that is often wrong and changing.

*"... rescues the a priori origin of the pure concepts of the understanding and the validity of the general laws of nature as laws of the understanding, in such a way that their use is limited only to experience, because their possibility has its ground merely in the relation of the understanding to experience, however, not in such a way that they are derived from experience, but that experience is derived from them, a completely reversed kind of connection which never occurred to Hume." (ibid.)*

And this is commented on in the Stanford Encyclopedia of Philosophy as:

*"Thus, Kant's "complete solution of the Humean problem" directly involves him with his whole revolutionary theory of the constitution of experience by the a priori concepts and principles of the understanding— and with his revolutionary conception of synthetic a priori judgments." (SEP BETTER CITATION)*

Hume in spite of his differences from Peirce, is nevertheless considered a "proto-Pragmatist." This assessment of him is largely based on Hume's view that our statements about the world should derive from our experiences. That is, our *doing* should constrain our *proposing* (this is also similar to the theory of culture developed in Everett (2016)).

Our impressions (experiences) are the original forms of all our ideas, Hume also argued. We see a hot pan on the stove, for example. As we approach we feel the warmth. But the experience becomes even more vivid if we touch the hot pan with our bare hand. From these

levels of experience we form our understanding and derive our predictions about heat.<sup>24</sup> The sense of warmth of Hume corresponds roughly to Peirce's "firstness;" touching the pan to Peirce's "secondness," and our understanding of heat to "thirdness."

Hume talked also about the difference between and origins of complex vs. simple impressions. For example, when we bite into an apple [a fruit of much symbolism in Western history, from representing original sin, to Newton's discovery of gravity, to the beginnings of our thinking processes, according to Hume] we experience multiple sensations simultaneously, experiences that can be teased apart by reflection. Thus such impressions precede our ideas and underly our grasp of complex thoughts. Complex perceptions can be reduced to simple ones. Complex thoughts to simple thoughts.

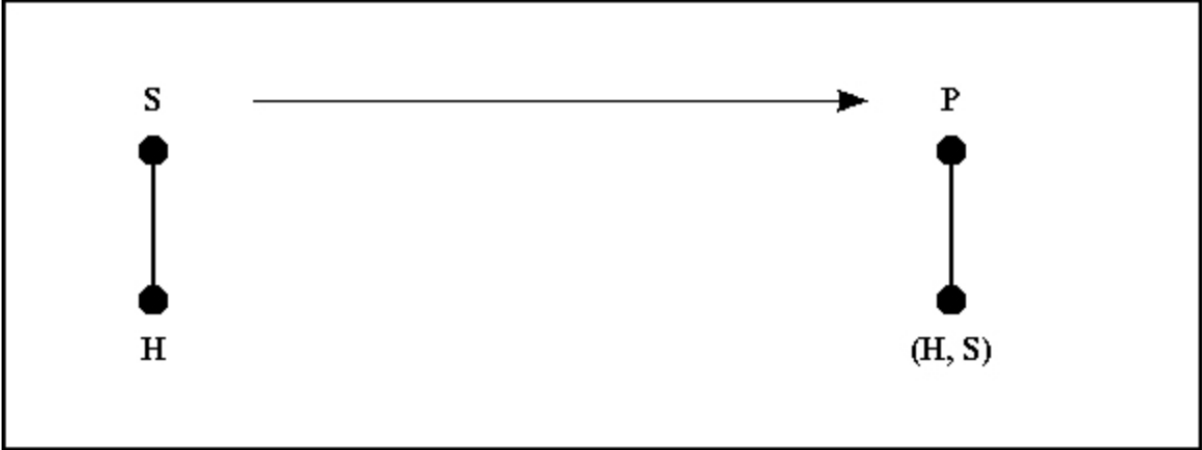
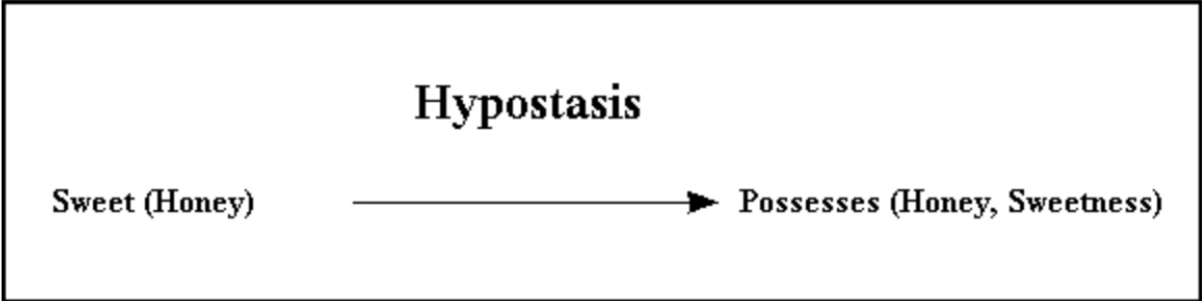
Peirce also argued that reflecting on experience can lead us to more complex thoughts from simple thoughts and simple thoughts from complex thoughts by peeling away simple thoughts from more complex thoughts can lead us to essential simple properties from more complex combinations.

For Peirce one way we transform simple thoughts to more complex propositions is through "hypostatic abstraction." So for example, from "Honey is sweet" we can derive "Honey has sweetness," producing via hypostatic abstraction the abstract category of "sweetness."

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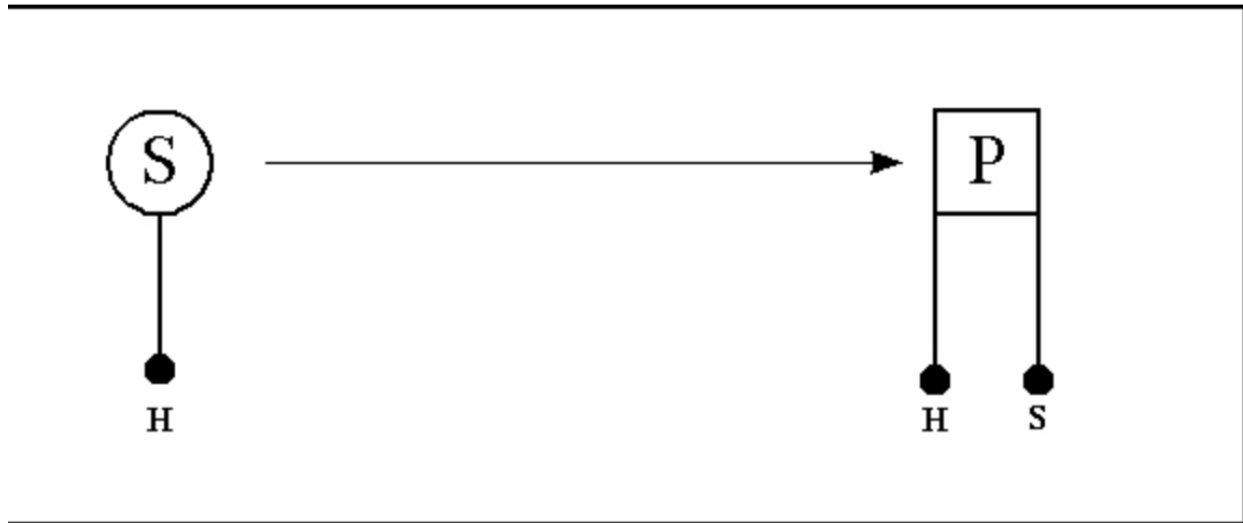
<sup>24</sup> These different impressions or Peircean categories should not be confused with "stages." Firstness does not precede secondness which does not precede thirdness. These impressions and categories are all available simultaneously as different modes of thinking about/experiencing objects.

This can be diagrammed as:<sup>25</sup>



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<sup>25</sup> Taken from <https://inquiryintoinquiry.com/2008/08/08/hypostatic-abstraction/> - this is one of the best sources on the web for Peircean ideas given with mathematical precision, a superb resource.



We can also, according to Peirce, extend our knowledge to new knowledge via abductive inference. And we can also derive simpler propositions from complex propositions by the Peircean process of *prescision* (see \_\_\_ below).

Hume additionally proposed principles of resemblance, contiguity, and cause as ways that human's passions extend their "knowledge." Interestingly these three categories of Hume's map relatively well onto Peirce's semeiotic concepts of icon (resemblance, correspondence), index (contiguity), and symbol (generalizations like "cause" that we arrive at based on our observations, also involving indexes and icons). And thus they also map onto Peirce's phenomenological categories, all of which are crucial for the Peircean theory of linguistics as well as his philosophy.

A point of serious divergence between Hume and Peirce had to do with scientific judgment. Because Hume rejected induction, he proposed that an alternative way to reach a judgment was the "majority" rules view - we should agree with the consensus of the majority of scientists. Reject as well anything that contradicts our most well-confirmed beliefs.

Peirce predictably opposes any such way of fixing our beliefs (Legg ()). We are always duty-bound to doubt. And there are any number of reasons people (including scientists) might come to believe as a majority that contaminate any supposed epistemological privilege of majority science opinion (think of the conflicting reports from scientists and the controversy over which group to believe during the world-wide pandemic of 2020). Truth is not democratically determined.

Hume's problem (cf. Legg ()) was that he lacked the concept of abduction, the logical form of hypothesis generation, "ampliative reference." Although Peirce's views on belief and reasoning are not discussed until chapter \_\_\_ in detail, the idea of abduction, hypothesis formation, and testing (induction and deduction) replace Hume's "majority opinion rules" idea. The consensus of genuine inquirers is very important for Peirce's concept of truth and the "end of inquiry." But whereas Hume would merely poll experts, in Peirce's review of his work, Peirce only recognizes as experts those who independently arrive at the same conclusions by appropriate inference, knowledge, and experiences. When experts agree from force of personality or stubbornness or "majority" they are "fixing their beliefs" incorrectly, thus vitiating the very value of any majority opinion. Not so with Peirce's experts, who form their beliefs individually by being forced by the facts and logically sound reasoning to a particular conclusion.

Hume influenced Peirce in several ways. But his work underscored as well for Peirce the relative bankruptcy in a program that lacks an account of abduction (not merely inference to the best explanation). For the rejection of miracles we cannot use either induction (statistical or otherwise) or deduction. The only way to evaluate human testimony from the past, if at all, is via abduction. (Courts are unlikely to indulge great amounts of abductive reasoning overtly

reflected in witness questioning though abduction no doubt plays a huge role in successful attorney's behind-the-scenes reasoning about testimony. They would fail regularly if they followed Hume's methods.)