ADAM SMITH’S PHILOSOPHY OF SCIENCE *

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Adam Smith’s reputation has been so firmly established as an economist and moral philosopher that there has been little curiosity about his important contributions to other fields of thought. Some attention has, it is true, been given to the Theory of Moral Sentiments as a clue to Smith’s intention in the Wealth of Nations; but it has usually been concluded that any comparison of the philosophy of these two works raises more problems than it solves. Smith's other works, including his published classroom lectures and his youthful writings on language, belles-lettres, and scientific method, have been almost completely neglected. It appears particularly unfortunate that Smith's History of Astronomy, in which he presents a complete philosophy of scientific discovery, has not been related in any detail to his own later scientific achievement in the Wealth of Nations.

Smith's studies in the history of science are the product of his youthful thought, and may well have been composed during the seven years that he spent, mainly reading in the library, at Oxford. We know that during these years Smith spent much of his time studying the works of Diderot and D'Alembert as they appeared in

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1. Jacob Viner, “Adam Smith and Laissez Faire” in The Long View and the Short (Glencoe, Ill.; Free Press, 1958), p. 216. “The Germans, who, it seems, in their methodical manner commonly read both the Theory of Moral Sentiments and the Wealth of Nations, have coined a pretty term, Das Adam Smith Problem, to denote the failure to understand either which results from the attempt to use the one in the interpretation of the other.

successive volumes of the *Encyclopaedia*, in translating French works into elegant English, and in composing some initial articles for a projected "history of the liberal sciences and elegant arts," which he intended to expand eventually to the proportions of an English "Encyclopedia." This work was later abandoned as "far too extensive," but the essay, *Principles which lead and direct Philosophical Enquiries, illustrated by the History of Astronomy*, has survived as the chief example of Smith's early thought. That Smith continued even in his later years to regard this essay as a significant achievement is indicated in his instructions to David Hume, his intended literary executor, in 1773:

> As I have left the care of all my literary papers to you, I must tell you that except those which I carry with me, there are none worth the publishing but a fragment of a great work, which contains a history of the astronomical systems that were successively in fashion down to the time of Descartes. Whether that might not be published as a fragment of an intended juvenile work I leave entirely to your judgment, tho' I begin to suspect myself that there is more refinement than solidity in some parts of it.\(^5\)

We assume that this *History of Astronomy* was put in its final form about 1750, either shortly after Smith's return from Oxford to Kirkaldy and Edinburgh, or during his early Glasgow years.

We have seen that Smith's mature judgment about the merits of his own early writing is not altogether unfavorable. Other historians have praised his work with less restraint. James McCosh, who was both a historian and a philosopher, contends that Smith might have ranked first in the English language as an historian of science, had he concentrated in this field.\(^6\) Dugald Stewart concludes that "the most unexceptionable specimens (of conjectural or theoretical history) which have yet appeared, are indisputably the fragments in Mr. Smith's posthumous work on the *History of Astronomy* and on that of the *Ancient Systems of Physics and Metaphysics.*"\(^7\) And Joseph Schumpeter, one of the great historians of economic thought in recent times, asserts that "nobody . . . can have an adequate idea of Smith's intellectual stature who does not know

4. References to this work, which will hereafter be referred to as the *History of Astronomy*, are from Smith's *Works*, ed. Dugald Stewart (London: Cadell & Davies, 1811), V, 55–190.
5. Rae, *op. cit.*, p. 262.
these essays (on the history of science). I venture to say that, were it not for the undeniable fact, nobody would credit the author of the Wealth of Nations with the power to write them.”8

I. CHARACTERISTICS OF SMITH’S EARLY WORK ON SCIENTIFIC METHODOLOGY

The outstanding feature of the History of Astronomy is a certain dynamic quality, whereby through his favorite principle of sympathy, Smith places himself en rapport with the scientists whose thought he appraises and with the times in which they wrote.9 Starting from the principles of human nature and the circumstances of the society in which each contributor lived, Smith attempts to trace the evolution of the Newtonian system as the latest phase of a continuing historical and social process. Dugald Stewart compares Smith’s approach to the history of science with the method previously adopted by D’Alembert.1

In accounting for the systematic dimension of his History of Astronomy, Adam Smith himself appears to give the main credit to Descartes:

In Natural Philosophy, or any other science of that sort . . . we may lay down certain principles, primary or proved, in the beginning, from whence we account for the several phenomena, connecting all together by the same chain. This latter, which we may call the Newtonian method, is undoubtedly the most philosophical, and in every sense, whether of Morals or Natural Philosophy, etc., is vastly more ingenious, and for that reason more engaging, than the other (the Aristotelian method). It gives us a pleasure to see the phenomena which we reckon the most unaccountable, all deduced from some principle (commonly a well-known one) and all united in one chain, far superior to what we feel from the unconnected method, where everything is accounted for by itself, without any reference to the others. We need not be surprised, then, that the Cartesian philosophy (for Descartes was in reality the first who attempted this method) though it does not perhaps contain a word of truth,—and to us who live in a more enlightened age and have more inquired into these matters, it appears very dubious,—should nevertheless

1. Stewart, Account of the Life and Writings of Adam Smith, LL.D. in Smith, Works, I, xxxv. “The Late M. d’Alembert has recommended that arrangement of their elementary principles (of the sciences) which is founded on the natural succession of inventions and discoveries, as the best adapted for interesting the curiosity and exercising the genius of students. . . . It is somewhat remarkable, that a theoretical history of this very science (in which we have, perhaps, a better opportunity than in any other instance whatever, of comparing the natural advances of the mind with the actual succession of hypothetical systems) was one of Mr. Smith’s earliest compositions.”
have been so universally received by all the learned in Europe at that time. The great superiority of the method over that of Aristotle . . . made them greedily receive a work which we justly esteem one of the most entertaining romances that have ever been wrote.2

A third important influence in molding Adam Smith's scientific method was the Baron de Montesquieu.3 It may be remembered that the Esprit des Lois was published during Smith's residence in Edinburgh, about three years prior to his appointment to the Chair of Logic at Glasgow. One of Smith's students during his early years at Glasgow suggests that his treatment of moral philosophy and jurisprudence was patterned in large part on this recent work by Montesquieu:

[Smith] treated at more length of that branch of morality which relates to justice, and which, being susceptible of precise and accurate rules, is for that reason capable of a full and particular explanation. Upon this subject he followed the plan that seems to be suggested by Montesquieu; endeavoring to trace the gradual progress of jurisprudence, both public and private, from the rudest to the most refined ages, and to point out the effects of those arts which contribute to subsistence, and to the accumulation of property, in producing correspondent improvements or alterations in law and government.4

In an article written for the Edinburgh Review in 1755, Smith indicates that the authors with whom he was then most familiar also included Rousseau, Voltaire, Daubenton, and Buffon.5 It appears to have been the French writers who exercised the greatest influence on Smith's scientific method and on his style, and who suggested to him the unusual project of outlining a philosophy of science before he had made a contribution to any particular science.

II. MOTIVES FOR PHILOSOPHICAL INQUIRIES

Joseph Black and James Hutton, who edited Smith's History of Astronomy, have added the explanation that this work "must be viewed, not as a History or Account of Sir Isaac Newton's Astron-
omy, but chiefly as an additional illustration of those Principles in the Human Mind which Mr. Smith has pointed out to be the universal Motives of Philosophical Researches."⁶ The specific principles of the human mind to which Adam Smith calls attention are wonder, surprise, and admiration. Thus, in explaining the priority of wonder, Smith asserts that:

Wonder, and not any expectation of advantage from its discoveries, is the first principle which prompts mankind to the study of Philosophy, of that science which pretends to lay open the concealed connections that unite the various appearances of nature; and they pursue this study for its own sake, as an original pleasure or good in itself, without regarding its tendency to procure them the means of many other pleasures.⁷

McCosh has stated that in Smith's view "wonder called forth by the new and singular, surprise excited by what is unexpected, and admiration raised by what is great and beautiful, these — and not any expectation of advantage or love of truth for its own sake — are the principles which prompt mankind to try to discover the concealed connections that unite the various appearances of nature, which give rise to the study of philosophy, which is defined as the science of the connecting principles of nature."⁸ McCosh's exclusion of "love of truth for its own sake" from Smith's motives for the study of philosophy appears unwarranted and unjust to Adam Smith. Yet the fact that the author of Wealth of Nations should so clearly rule out "any expectation of advantage" as a typical motive for philosophical inquiries seems both surprising and wonderful, and invites further search into the reasons for this apparent discrepancy in Smith's thought.

Smith points to security and leisure as the necessary conditions for that sentiment of wonder which is the basis for all philosophical inquiries:

When law has established order and security, and subsistence ceases to be precarious, the curiosity of mankind is increased, and their fears are diminished. The leisure which they then enjoy renders them more attentive to the appearances of nature, more observant of her smallest irregularities, and more desirous to know what is the chain which links them altogether. . . . And that magnanimity and cheerfulness, which all generous natures acquire who are bred in civilized societies, where they have so few occasions to feel their weakness, and so many to be conscious of their strength and security, renders them less disposed to employ, for this connecting chain, those invisible beings whom the fear and ignorance of their rude forefathers had engendered. Those

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⁶ Works, V, 190.
⁸ McCosh, op. cit, pp. 170–71.
of liberal fortunes, whose attention is not much occupied either with business or with pleasure, can fill up the void of their imagination, which is thus disengaged from the ordinary affairs of life, no other way than by attending to that train of events which passes around them.\(^9\)

The emphasis in this passage may at first seem difficult to reconcile with the prominence given in the *Wealth of Nations* to self-interest and to competition. The explanation that must be made is that the passions of ordinary life which dominate the thought of the *Wealth of Nations* are pictured, not as vehicles of intellectual progress, but only as forces contributing to progress in opulence. Subsequently, when the increment in opulence has been employed to support a more numerous leisured class, philosophy may also become a beneficiary.

Smith's subordination of utility to the intellectual or aesthetic sentiments of wonder, surprise, and admiration is apparent in the *Theory of Moral Sentiments*, as well as in the *History of Astronomy*:

The greater part of the praise . . . is bestowed upon what are called the intellectual virtues. . . . The utility of these qualities, it may be thought, is what first recommended them to us; and, no doubt, the consideration of this, when we come to attend to it, gives them a new value. Originally, however, we approve of another man's judgment, not as something useful, but as right, as accurate, as agreeable to truth and reality.\(^1\)

A large portion of the material in the *Theory of Moral Sentiments* is devoted to an attack on those who would propose utility as the primary objective of scientific investigations or of ethical judgments. Smith's interest in this issue seems to have been provoked mainly by the unusual prominence given to utility by David Hume. In Smith's view, utility should be regarded as only one among several features of beauty, from which it derives its value:

That Utility is one of the principal sources of beauty, has been observed by every body who has considered with any attention what constitutes the nature of beauty. . . . That the fitness of any system or machine to produce the end for which it was intended, bestows a certain propriety and beauty upon the whole . . . is so very obvious, that nobody has overlooked it. . . . The same principle, the same love of system, the same regard to the beauty of order, of art and contrivance, frequently serves to recommend those institutions which tend to promote the public Welfare.\(^2\)

It is in the abstruser sciences, particularly in the higher parts of mathematics, that the greatest and most admired exertions of human reason have been displayed. But the utility of those sciences . . . is not very obvious, and

to prove it, requires a discussion which is not always very easily compre-
hended. It was not, therefore, their utility which first recommended them to
the public admiration. This quality was but little insisted upon, till it became
necessary to make some reply to the reproaches of those, who, having them-
selves no taste for such sublime discoveries, endeavour to depreciate them as
useless.\(^3\)

Notable in all Smith's works is his minimal emphasis upon the
natural or inherited abilities of individuals as factors in the advance
of knowledge. In keeping with the equalitarian tradition of Locke
and Rousseau, Smith regards knowledge as a product of society, or
of that part of society which is endowed with leisure and security.
Through the *division of labor* individuals are differentiated, and
those who have specialized in the particular arts and sciences where
superior discernment is necessary acquire taste and judgment with
regard to their own field of competence.\(^4\) The advance of knowledge
thus becomes cumulative; each advance should provide more leisure
and security for affluent individuals to devote more time to its
advancement. Their inquiries tend to augment utility as well as to
extend the limits of knowledge; but it is the sentiment of wonder
which motivates these inquiries.

Not only does Smith repudiate *utility* as the main object of
scientific inquiry, but he repeatedly extols the distinctive role of
the philosopher. Sir Isaac Newton is referred to as a philosopher,
and not as a scientist.\(^5\) In this, his outlook contrasts sharply with
that of Thomas Hobbes, Bernard de Mandeville, Jeremy Bentham,
and certain other materialistic utilitarians with whose thought he is
in some respects associated. The following quotation taken from
Smith's classroom lectures at Glasgow University is a strong en-
dorsement of a philosophical perspective:

> It was probably a farmer who made the original plough, though the
improvements might be owing to some other. Some miserable slave who had
perhaps been employed for a long time in grinding corn between two stones,
probably first found out the method of supporting the upper stone with a
spindle. A mlin-wright perhaps found out the way of turning the spindle with
the hand; but he who contrived that the outer wheel should go by water was
a philosopher, whose business it is to do nothing, but observe everything.
They must have extensive views of things, who, as in this case, bring in the
assistance of new powers not formerly applied.\(^6\)

5. "Conditions concerning the First Formation of Languages" in Smith,
*Theory of Moral Sentiments*, op. cit., p. 509. "We say ... of a philosopher,
that he is a Newton."
6. *Lectures on Justice, Police, Revenge and Arms*, ed. Cannan (Oxford:
Boswell reports that when the publication of Smith's *Wealth of Nations* was mentioned to Samuel Johnson, who had long been unfriendly to Smith, it was expected that Johnson would speak contemptuously of this work by an author who had had little practical experience in the field on which he was writing. To the surprise of all, Johnson remarked:

A man who has never been engaged in trade himself may undoubtedly write well upon trade, and there is nothing which requires more to be illustrated by philosophy than trade does. . . . A merchant seldom thinks but of his own particular trade. To write a good book upon it a man must have extensive views. It is not necessary to have practiced, to write well upon a subject.7

III. THE AESTHETIC ELEMENT IN SMITH'S STANDARD OF JUDGMENT

To a person familiar only with Smith's *Wealth of Nations*, it seems surprising that the standard of judgment which is favored by Smith in his early writings should be that of beauty, or appeal to the taste.8 This taste is that of the mature scholar who is a complete master of his subject; and the elements of beauty on which he passes judgment are simplicity, elegance, harmony, continuity, and coherence. Yet it is a striking feature of Smith's system of science that he more frequently refers to his own standard of judgment as aesthetic than as strictly rational,9 and that as his final criterion of truth he is willing to accept neither the rational test of consistency nor the empirical standard of correspondence with the observed facts. In preferring the criterion of beauty, Smith appears to be at one with his teacher, Francis Hutcheson (d. 1746) and also with Lord Shaftesbury (d. 1713), who is regarded as the founder of the cult of style in Britain.

Smith speaks of himself occasionally as an empiricist, yet his reluctance to align himself with the purely inductive school of scientific methodology was due to the excesses to which this method had been carried by previous generations of scholars. The empiricism of Bacon, Hobbes, and Locke appeared unsatisfactory to Smith

8. Even in the *Wealth of Nations*, we find traces of Smith's aesthetic ideal. For instance, *Wealth of Nations*, V, I, p. 724: "The beauty of a systematical arrangement of different observations connected by a few common principles, was first seen in the rude essays of those ancient times towards a system of natural philosophy. Something of the same kind was afterward attempted in morals."
9. One critic observes: "It is clear . . . that Smith deliberately proposed to make an emotional rather than an intellectual appeal to the interest of the students [at Glasgow], to stimulate their feelings and their aesthetic sense, rather than their powers of reasoning," Lothian, *Introduction*, to Adam Smith, *Lectures on Rhetoric and Belles Lettres*, op. cit., p. xvi.
for several reasons. In emphasizing the objective, measurable, truth, it had isolated the "primary qualities" of things, which appeared to reflect the substantial reality of "matter in motion," and had neglected the "secondary qualities" of color, sound, taste, and smell. Yet Smith had been persuaded by the demonstrations of Berkeley that these secondary qualities were not separable in such an absolute manner from the more tangible primary qualities. By thus obscuring the clear distinction between the primary and secondary qualities, Berkeley had undermined the bases of certainty and definiteness which the early empirical school regarded as its chief merit. Smith's emphasis on the "secondary qualities" can be seen in the following quotation from his academic lectures at Glasgow, about 1763:

Man is the only animal who is possessed of such a nicety that the very color of an object hurts him. Among different objects, a different arrangement or division of them pleases. The taste of beauty, which consists chiefly in the three following particulars, proper variety, easy connexion, and simple order, is the cause of all this niceness. Nothing without variety pleases us.¹

The element of beauty within an object or within a representation of this object in a painting or in a scientific system seemed to Smith to have a substantive meaning, and to point to the form or species to which this particular object belonged:

In each species of creatures, what is most beautiful bears the strongest characters of the general fabric of the species, and has the strongest resemblance to the greater part of the individuals with which it is classed. Monsters, on the contrary, or what is perfectly deformed, are always most singular and odd, and have the least resemblance to the generality of that species to which they belong. And thus the beauty of each species, though in one sense the rarest of all things, because few individuals hit this middle form exactly, yet in another is the most common, because all the deviations from it resemble it more than they resemble one another. The most customary form therefore is, in each species of things . . . the most beautiful.²

In preference to either a consistent rationalism or a strictly inductive process of reasoning, Smith favored the intuitive judgment of the expert, who through extensive experience and erudition with a particular field of study has acquired a skill or taste with respect to his field of specialization. From such a perspective, the beauty, order, and harmony of a system of thought become parts of its verification.

The more practiced thought of a philosopher, who has spent his whole

1. Lectures on Justice, Police, Revenue, and Arms, op. cit., p. 158.
life in the study of the connecting principles of nature, will often feel an interval betwixt two objects, which, to more careless observers, seem very strictly conjoined. By long attention to all the connections which have ever been presented to his observation, by having often compared them with one another, he has, like the musician, acquired, if one may say so, a nicer ear, and a more delicate feeling with regard to things of this nature.3

The truly culpable error of the scientist, in Smith's view, is to ignore the thought of his own age, to theorize subjectively or in isolation, and to fail to keep abreast of the discoveries currently being made by contemporary scholars within his field of competence:

Neither Cicero nor Seneca, who have so often occasion to mention the ancient systems of Astronomy, take any notice of Hipparchus. His name is not to be found in the writings of Seneca. . . . Such profound ignorance in these professed instructors of mankind, with regard to so important a part of the learning of their own times, is so very remarkable, that I thought it deserved to be taken notice of, even in this short account of the revolutions of philosophy. . . . That supercilious and ignorant contempt, too, with which at this time they regarded all mathematicians, among whom they counted astronomers, seems to have hindered them from enquiring so far into their doctrines as to know what opinions they held.4

Smith's adherence to the school of Shaftesbury and Hutcheson is especially apparent in his emphasis upon literary style in his own works. The style of presentation appears to Smith to be so intimately related to the substance of an argument, that the two could not be isolated.5 The task of the scientist might be compared to that of the artist; he should select or abstract those features of his subject which seem most essential to its being and operations, and should accentuate these features in his own representative system. In modern economics, this procedure has been called model building; but Smith conceived it less mathematically as akin to the painting of a picture.6 Thus two or more alternate theories may provide equally satisfactory explanations of a given body of phenomena, and may be equally true; the one explanation would be preferred to another on account of its simplicity and elegance.

4. Ibid., pp. 115–16.
5. Even the division of labor is derived by Smith from a desire to persuade. Thus: "Different genius is not the foundation of this disposition to barter which is the cause of the Division of Labor. The real foundation is that principle to persuade which so prevails in human nature." Lectures on Justice, Revenue, Police and Arms, op. cit., p. 171.
6. John Kenneth Galbraith has listed Adam Smith among the two or three greatest stylists among all those who have written on economics in the English language, calling attention to Smith's humor and irony. It is in large part by conscious attention to the style of his writing that Smith achieved this distinction. Cf. Galbraith, "The Language of Economists," in Fortune, LXVII (Dec. 1962), 129.
Smith’s preoccupation with taste as a main criterion by which to appraise a system of thought derives in large part from his close association with David Hume (d. 1776). Even during his student days at Oxford, Smith had been reprimanded for reading Hume’s *Treatise of Human Nature,* and at a much later period he speaks of Hume as “by far the greatest philosopher of his age.” Over a period of more than twenty years, Smith and Hume had been accustomed to read each other’s manuscripts and to discuss their conclusions prior to publication. Hume’s skeptical position with regard to any certainty of knowledge about the external world is well summarized in the following quotation: “’Tis not solely in poetry and music we must follow our taste and sentiment, but likewise in philosophy . . . reason is and ought only to be the slave of the passions.”

Although Adam Smith’s views of epistemology are revealed only by occasional comments, these suffice to establish that at least in his earlier years he shared the skeptical metaphysical views of Hume. These include a belief that causal connections, however well substantiated they might seem in practice, have their existence only in the imagination which attributes external reality and necessity to certain configurations of events which normally occur in a given sequence. Typical of Smith’s position is the following passage from the *History of Astronomy:*

Even we, while we have been endeavouring to represent all philosophical systems as mere inventions of the imagination, to connect together the otherwise disjointed and discordant phaenomena of nature, have insensibly been drawn in, to make use of language expressing the connecting principles of this one, as if they were the real chains which Nature makes use of to bind together her several operations. Can we wonder then, that it (Newton’s System) should have gained the general and complete approbation of mankind, and that it should now be considered, not as an attempt to connect in the imagination the phaenomena of the Heavens, but as the greatest discovery that ever was made by man, the discovery of an immense chain of the most important and sublime truths, all closely connected together, by one capital fact, of the reality of which we have daily experience.

Smith’s view seems to be that all causal relationships are metaphysical; the phenomena which they relate are known empirically,

but any explanation of these phenomena must make use of metaphysical concepts that reflect the outlook of a given age and a particular school of thought. Smith likens science or philosophy to the effort of a person attending a stage play to imagine what stage effects behind the scene might be the causes of the visible changes; or to the reasonings of the spectator at an unfamiliar card game who undertakes to discover the rules of the game merely by observing the cards which are played in silence. This concept of a scientific system as an imaginative construct intended to explain otherwise chaotic and discordant phenomena bears a striking resemblance not only to the thought of David Hume, but also to the views expressed in more recent times by Albert Einstein:

Science is not just a collection of laws, a catalogue of unrelated facts. It is a creation of the human mind, with its freely invented ideas and concepts. Physical theories try to form a picture of reality and to establish its connection with the wide world of sense impressions. Thus the only justification for our mental structures is whether and in what ways our theories form such a link.

V. The Selected Analogy as the Organizing Principle of a Science

A student of the Scottish literature of Smith's time has stated that the definition of science then required that "every system of science should possess, in order to be considered scientific at all, a general principle capable of unifying and organizing the whole mass of material. Smith observes in the History of Astronomy that such an organizing principle for a new science has generally been selected as an analogy from some other art or science, in which a new discovery has previously been made, and has been adapted to serve as the "main hinge" for a related science. In this way, by a process of cross-fertilization among the arts and sciences, each field has received new impetus from the application of hypotheses which, on account of their demonstrated usefulness in some other branch of knowledge, are employed experimentally in this new science. Individuals with the "extensive" outlook of philosophers are occupied with the search for fruitful analogies which may be employed as

2. There seems to be little foundation for the position of certain American Institutionalists who would picture the Newtonian outlook as absolutist. Smith's Newtonian perspective was altogether relativistic.


organizing principles to impart greater simplicity and accuracy to another science. Such were the contributions of Copernicus, Descartes, and Sir Isaac Newton.

Adam Smith explains in detail the characteristics of the fruitful analogy:

Aristotle observes, that the early Pythagoreans, who first studied arithmetic, explained all things by the properties of numbers; and Cicero tells us, that Aristoxenus, the musician, found the nature of the soul to consist in harmony. In the same manner, a learned physician lately gave a system of moral philosophy based upon the principles of his own art, in which wisdom and virtue were the healthful state of the soul. . . . In the same manner also others have written parallels of painting and poetry, of poetry and music, of music and architecture, of beauty and virtue, of all the fine arts; systems which have universally owed their origin to the lucubrations of those who were acquainted with the one art, but ignorant of the other; who therefore explained to themselves the phaenomena, in that which was strange to them, by those in that which was familiar; and with whom, upon that account, the analogy, which in other writers gives occasion to a few ingenious similitudes, became the great hinge upon which every thing turned.6

Such an analogy, in order to serve as an organizing hypothesis for a new system of science, must satisfy several requirements. It must be simple; it must be familiar; and it must be capable of uniting the otherwise disconnected and chaotic phenomena of the field in which it is to be applied.7 The propensity to wonder is natural to the human mind, and a further propensity exists to seek for a solution to the problem which gave rise to the sentiment of wonder; even a false answer, if concurred in by others, may provide satisfaction to a person who was seriously troubled by the excess of wonder.8 The discovery of an apt analogy helps to restore tranquility to the mind which was once disposed to wonder, and this is the chief end of philosophy.9

8. "If a person asserts anything about the moon, though it should not be true, he will feel a kind of uneasiness in being contradicted, and would be very glad that the person he is endeavouring to persuade should be of the same way of thinking with himself." Smith, Lectures on Justice, Police, Revenue and Arms, op. cit., p. 171.
9. "Nothing can more evidently show, how much the repose and tranquility of the imagination is the ultimate end of philosophy, than the invention of the Equalizing Circle. . . . These philosophers transported themselves, in fancy, to the centres of these imaginary circles, and took pleasure in surveying from thence, all those fantastical motions, arranged, according to that harmony and order, which it had been the end of all their researches to bestow upon them. Here, at last, they enjoyed that tranquility and repose which they had pursued through all the mazes of this intricate hypothesis; and here they beheld this, the most beautiful and magnificent part of the great theatre of nature, so disposed and constructed." History of Astronomy, op. cit. pp. 80-81.
VI. Smith’s "Moral Newtonianism" and "Historical Aristotelianism"

Having selected an hypothesis or organizing principle for a science, the philosopher then proceeds to explain in terms of this principle the causal relationships that exist within his field. The composed and orderly system that is thus constructed will be an imaginary machine, responding with maximum elegance and efficiency to the impulse of the great hinge or the main principle, which must control all its divergent wheels and motions:

Systems in many respects resemble machines. A machine is a little system, created to perform, as well as to connect together, in reality, those different movements and effects which the artist has occasion for. A system is an imaginary machine invented to connect together in the fancy those different movements and effects which are already in reality performed. The machines that are first invented to perform any particular movement are always the most complex, and succeeding artists generally discover that, with fewer wheels, with fewer principles of motion, than had originally been employed, the same effects may be more easily produced. The first systems, in the same manner, are always the most complex, and a connecting chain, or principle, is generally thought necessary to unite every two seemingly disjointed appearances; but it often happens, that one great connecting principle is afterwards found to be sufficient to bind together all the discordant phenomena that occur in a whole species of things.¹

The imaginary machine that is thus constructed must have as its main hinge an analogy or hypothesis which is generally familiar, and which will impart greater simplicity to the system:

Philosophy is the science of the connecting principles of nature. . . . By representing the invisible chains which bind together all these disjointed objects, (it) endeavours to introduce order into this chaos of jarring and discordant appearances, to allay this tumult of the imagination, and to restore it, when it surveys the great revolutions of the universe, to that tone of tranquility and composure which is both more agreeable in itself, and most suitable to its nature. . . . No system, how well soever in other respects supported, has ever been able to gain any general credit on the world, whose connecting principles were not such as were familiar to all mankind.²

Two analogies appear to dominate the arrangement of the materials in the Wealth of Nations. The first of these is Newtonian in origin, and the second is adapted from the Aristotelian concept of Natural Teleology, or of a Purposeful Nature. Adam Smith was one of the few economists who experienced some success in integrat-

1. Ibid., p. 116.
2. Ibid., pp. 80–82.
ing a systematic analysis of economic phenomena with an additional perspective of historical development.

Sir Isaac Newton had suggested, some decades before Smith, that his own mechanical perspective be adapted to the social sciences, stating in the first edition of the *Principia*:

I wish we could derive the rest of the phenomena of Nature by the same kind of reasoning from mechanical principles, for I am induced by many reasons to suspect that they may all depend upon certain forces by which the particles of bodies, by some causes hitherto unknown, are either mutually impelled toward one another, and cohere in regular figures, or are repelled and recede from one another.3

And at the end of the *Opticks*, Newton added that “if natural philosophy in all its parts, by pursuing this method, shall at length be perfected, the Bounds of Moral Philosophy will also be enlarged.”4

Smith, in his two most important works, appears to have taken his main hypothesis, or his analogy, from the Newtonian principle of attraction. In both the *Theory of Moral Sentiments* and the *Wealth of Nations*, the structure of the system is constituted by an equilibrium between the individual and society. In the *Theory of Moral Sentiments*, sympathy serves as the regulating force which sustains the divergent motions of individuals and directs their courses within the harmonious pattern established by nature.5 This is noted by Hume, who, shortly after the completion of this work, wrote to Smith: “I wish you had more particularly and fully proved that all kinds of sympathy are agreeable. This is the hinge of your system, and yet you only mention the matter cursorily.”6

In the *Wealth of Nations*, Smith’s ruling principle is “the desire of bettering our condition, a desire which, though generally calm and dispassionate, comes with us from the womb, and never leaves us until we go into the grave.”7 Smith had explained in the *Theory*

4. Isaac Newton, *Opticks*, III, i, qu. 3.
5. Various suggestions have been made to explain the origin of Smith’s concept of sympathy, or of its use as the organizing principle for his system of ethics. Smith himself acknowledges that he employs the term sympathy in an unusual sense, more akin to the Greek root-word than to the word in its modern usage. “Pity and compassion are words appropriated to signify our fellow-feeling with the sorrow of others. Sympathy, though its meaning was, perhaps, originally the same, may now, however, without much impropriety, be made use of to denote our fellow-feeling with any passion whatever.” *Theory of Moral Sentiments*, op. cit., I, I, i, p. 5. One can scarcely fail to notice the mechanical aspect of Smith’s use of sympathy, as the force relating the individual to society. The interaction between the main characters and the chorus in Greek drama has also been pointed to as an important source for Smith’s distinctive employment of the concept of sympathy.
6. Rae, op. cit., p. 145.
of *Moral Sentiments* that this desire, or any success in "bettering our condition," can do nothing to increase our happiness, because "between one permanent situation and others, there was, with regard to real happiness, no essential difference." Yet the desire for betterment is a propensity or an instinct that is part of human nature, having been implanted within man as an artifice of Nature and as part of the beneficent process of *illusion*. Under the impulse of this inescapable propensity, man is driven to creative activity and becomes an agent of nature in her effort to keep society in motion and in a gradual state of advance. *Self-interest* imparts the motion to society, and sympathy directs the motion within wholesome restraints. The goal of this process appeared to Smith to be greater *refinement*; that is, an increase in the variety, the beauty, and the purposeful activity of human life. Man is thus led "to cultivate the ground, to build houses, to found cities and commonwealths, and to invent and improve all the sciences and arts which ennoble and embellish human life."*

This picture differs in two important respects from the popular impression of the *Wealth of Nations*. Self-interest is not extolled for its own sake, but is considered as powerful human sentiment which might be more effectively harnessed as an instrument of economic progress. And the goal of the economic system is regarded more as progress in refinement and in creative activity than as maximizing utility in a material sense.

The second of the two *analogies* which dominate Smith's works is adapted from the Aristotelian concept of *natural teleology*, or of a purposeful *nature*. The distinction between *final causes* and *efficient causes*, which was elaborated theoretically by Aristotle, is employed in a more ambitious manner by Smith, as he distinguishes between the purpose of *nature* in history, and the intentions of individuals who are unaware of the true source or purpose of their instincts. This Aristotelian distinction is expanded by Smith into a *deception*, or *illusion theory*.

Self-preservation, and the propagation of the species, are the great ends which Nature seems to have proposed in the formation of all animals. . . . Nature has directed us to the greater part of these by original and immediate instincts. Hunger, thirst, and the passion which unites the two sexes, the love of pleasure, and the dread of pain, prompt us to apply those means for their

9. *Ibid.*, IV, I, p. 263. "It is well that Nature imposes upon us in this manner. It is this deception which rouses and keeps in motion the industry of mankind."
own sakes, and without any consideration of their tendency to those beneficent ends which the great Director of Nature intended to produce by them.2

This analogy, taken from the most commonplace observations in biology, is applied by both Smith and Montesquieu to the field of history, where it is used to justify or to explain their confidence that a progressive force exists in nature, apart from any conscious human planning.3 Whereas Grotius and Locke had regarded nature in a static sense as a source of law, Smith’s view was that nature operated as an active force. Smith’s typical reference is to “the natural course of things,” or “the natural order of things.” Even when Smith refers to nature as a source of law, he refers merely to the limitations which a constant human nature or an established trend of history would impose upon the legislator.4 Nature determines laws only by imposing limits, not by specifying detailed enactments. Laws might be enacted contrary to human nature or in opposition to the course of history, but the enforcement of such laws will be difficult and will involve great social and economic waste.

Both in his outlook on historical change, and in his method of reasoning on historical subjects, Smith resembles Darwin. In a famous passage in the Wealth of Nations, Smith pictures the harmony and progress that are in evidence when the natural human propensities are allowed to operate without artificial restraints:

Every individual necessarily labours to render the annual revenue of the society as great as he can. He generally, indeed, neither intends to promote the public interest, nor knows how much he is promoting it. . . . He intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to promote an end which was no part of his intention. . . . By pursuing his own interest he frequently promotes that of the society more effectually than when he really intends to promote it.5

2. Ibid., II, I, p. 109.
3. James Bonar, Philosophy and Political Economy (New York: Macmillan, 1893), p. 163. “There is no reason, on Adam Smith’s philosophical principles, why human society should have been deliberately contrived by its members any more than the planetary system consciously framed by its own parts.”
4. Dugald Stewart, Account . . . , op. cit., liii. Mr. Hume adds that “the policy of ancient times was VIOLENT, and contrary to the NATURAL course of things” — by which, I presume, he means that it aimed too much at modifying, by the force of positive institutions, the order of society, according to some preconceived idea of expediency; without trusting sufficiently to those principles of the human constitution, which, wherever they are allowed free scope, not only conduct mankind to happiness, but lay the foundation of a progressive improvement in their condition and in their character. The advantages which modern policy possesses over the ancient, arose principally from its conformity, in some of the most important articles of political economy, to an order of things recommended by nature.
The inclusion within his system of a concept of a purposeful nature is a feature which distinguishes Smith from the more mechanistic French economists, such as the Physiocrats — or, in a later century, Leon Walras. Quesnay's neglect of this dimension of nature calls for a sharp criticism from Smith:

He [Quesnay] seems not to have considered that in the political body, the natural effort which every man is continually making to better his own condition is a principle of preservation capable of preserving and correcting, in many respects, the bad effects of a political economy, in some degrees both partial and oppressive. . . . If a nation could not prosper without the enjoyment of perfect liberty and perfect justice, there is not in the world a nation which could ever have prospered. In the political body, however, the wisdom of nature has fortunately made ample provision for remedying many of the bad effects of the folly and injustice of man; in the same manner as it has done in the natural body, for remedying those of his sloth and intemperance.6

VII. ADAM SMITH'S PURPOSE IN THE Wealth of Nations

Most readers of the Wealth of Nations experience some surprise at the discovery that Adam Smith should have adhered, at least during his earlier years, to an aesthetic or to a purely analytic ideal of science. The goals of the Wealth of Nations seem utilitarian, and a rather materialistic concept of utility appears to replace the stoic ethic which underlies the Theory of Moral Sentiments. The transition in Smith's thought has led some scholars to conclude that Smith the analyst had given way to Smith the reformer.

Leo Rogin, an outspoken representative of the school of thought which would characterize the Wealth of Nations as primarily normative or polemical, argues that Smith's model has been "quite frankly employed as (an argument) for specific programs of reform. Obviously, however, the validity of an argument must be appraised with reference to the issue to which it is addressed."7 Rogin supports this contention by citing a passage from a letter by Smith, representing the Wealth of Nations as "a very violent attack . . . upon the whole commercial system of Great Britain."8 Arguing that this statement implies that the Wealth of Nations was intended primarily as a pattern for social reform, Rogin asserts that Smith's "obvious and simple system of liberty" was an ideal and normative system, having little relevance analytically.

6. Ibid., IV, IX, p. 638.
In presenting this thesis, Rogin maintains that to be genuinely scientific, a system must deal with "what is" rather than with "what ought to be"; and that the "questions posed . . . should be susceptible of solutions in which adequately trained people will ultimately acquiesce." The system that is presented "must conform to the necessities imposed by persistently effective matters of fact." Measured by these criteria, Rogin concludes that the Wealth of Nations fails to qualify as an "objective" or a "scientific" work, and must therefore be classified as "normative economic theory."

This characterization of the Wealth of Nations is one which cannot be refuted completely or easily, but which calls for some important qualifications. The first of these is that the fundamental value judgment found in this work is the very broad proposition that "consumption is the sole end and purpose of all production." A misconception which must be dispelled is that some other principle, such as laissez faire or competition is Smith's implicit norm or goal. These are, in fact, only subordinate or instrumental elements in Smith's system. His espousal of the material well-being of the common people is the revolutionary normative judgment that distinguishes the Wealth of Nations from the History of Astronomy.

A more important misconception regarding Smith's purpose is that his adherence to a simple and elegant system is an expression of contempt for the facts pertaining to the subject. Actually, Smith's own account of his reasons for employing a simple system seem adequate and convincing. To have incorporated all observed facts within this field of study would have complicated the system needlessly and would have been a methodological regression in terms of Smith's philosophy of science. Smith therefore seemed willing to abstract from the random elements of history so as to construct a system that would provide a simple representation of its essential features. So decisive was the impact of the Newtonian methodology, that Dugald Stewart remarks with reference to Smith's procedure: "It is of more importance to ascertain the progress that is most simple, than the progress that is most agreeable to fact."

Two other aspects of Smith's thought should also be taken into consideration as explanations of the apparently ideal or metaphysical element in the Wealth of Nations. Stewart makes special mention of Smith's curiosity regarding "the principles of human nature" and the "circumstances of society." Although Smith was

not unwilling to abstract from many of the features of society, he was insistent on giving more than the usual emphasis to the logic of historical change and to the propensities of human nature. He was not willing to restrict his speculations to economic statics or to the purely mechanical relationships of economic phenomena.

Thus we can see that the statements of Smith's early biographers fail to bear out Rogin's claim that Smith intended that his work be primarily normative in character. The apparently normative aspects of the Wealth of Nations reflect Smith's efforts to account for the trend of historical development and to do justice to the fundamental principles of psychology, as well as to present a coherent system. Though it cannot be denied that Smith's "obvious and simple system of liberty" was thought of by certain statesmen of a later age as a pattern or a blueprint, it must be recognized that Smith thought of his own system as deducible from the realities of history, psychology, and logic. The word inquiry, which is used in the title of Smith's work, suggests likewise that its purpose was largely analytic. The following quotation from the Account by Stewart traces more closely the relationship of the Wealth of Nations to Smith's earlier theory of science.

In Mr. Smith's writings, whatever be the nature of his subject, he seldom misses an opportunity of indulging his curiosity, in tracing from the principles of human nature, or from the circumstances of society, the origin of the opinions and the institutions which he describes. I formerly mentioned a fragment concerning the History of Astronomy which he has left for publication; and I have heard him say more than once, that he had projected, in the earlier part of his life, a history of the other sciences on the same plan. In his Wealth of Nations, various disquisitions are introduced which have a like object in view, particularly the theoretical delineation he has given of the natural progress of opulence in a country; and his investigation of the causes which have inverted this order in the different countries of modern Europe. His lectures on jurisprudence seem, from the account of them formerly given, to have abounded in such inquiries.

It seems to have been Stewart's view that, while the subject matter of Smith's Wealth of Nations required some modification of the methods appropriate to astronomy, the general concept of science presented in his early writings remained substantially unchanged.

3. Ibid., liv. "The great and leading object in his [Smith's] speculations is, to illustrate the provisions made by nature in the principles of the human mind, and the circumstances of man's external situation, for a gradual and progressive augmentation in the means of national wealth."

4. Ibid., xxxvi-xxxvii.

5. Stewart obviously does not accept Rogin's criterion of the agreement of scholars as a necessary condition for scientific proof. Both Dugald Stewart and Adam Smith believed that the collaboration of scholars was necessary for
Smith’s own statements in the Wealth of Nations indicate likewise that he had not abandoned the philosophical ideals of his earlier years. These passages imply that he still considered it the main task of philosophy to seek for the invisible chains which unite and direct the visible phenomena of nature. Positivist scientists and philosophers have been of the opinion that the phenomena are almost self-explanatory, and that little more than a record of observations is necessary. Smith’s view, which is expressed in his earliest writings, is that a science must explain causal relationships that are exceedingly complex, and where more than one explanation may be offered that is consistent with the observed facts.

That the subject of political economy possessed a structure of its own, and that its investigation required analytic methods distinct from those used in astronomy, Smith would be the first to concede. The finding which is of greatest interest, however, is that Smith himself saw a close affinity between the method pursued by Newton in the study of astronomy, and the method which would be the most fruitful in political economy or moral philosophy. It was his intention to select an analogy from the Newtonian astronomy, which might be applied as an hypothesis in the fields of moral philosophy and political economy. According to Smith’s own outline of his material, the Wealth of Nations was to be a study in expediency, while the Theory of Moral Sentiments was to be a study in propriety. Differences may be observed in Smith’s procedure in each of his works, attributable mainly to the great variety of subject matter; yet each of these attempts to explain a complex mass of phenomena by a few simple and familiar principles.

The features which stand out in Smith’s early delineation of the philosophy of science, and which he intended to apply in the Theory of Moral Sentiments and the Wealth of Nations, are the following:

1. A science must be a unity. A science or an art must grasp the essential features of its subject, and must present all parts of

the furtherance of knowledge, but they thought of knowledge as a dynamic process where any general consensus of scholars could not long persist. Ibid., xxxviii.


7. Stewart, Account . . . , op. cit., xxxviii. “When different theoretical histories are proposed by different writers, of the progress of the human mind in any one line of exertion, these theories are not always to be understood as standing in opposition to each other. If the progress delineated in all of them be plausible, it is possible at least, that they may all have been realized; . . . but whether they have been realized or not is of little consequence. In most cases it is of more importance to ascertain the progress that is most simple, than the progress that is most agreeable to fact.”
this subject as a unity that is at once elegant and harmonious. Adam Smith gives the main credit to Descartes and to Newton for establishing this principle of unity and simplicity.

(2) The formulation of a system of science occurs through a social and historical process. Any system of science takes shape gradually, through the common efforts of a community of scholars, but it is never complete. Montesquieu may be regarded as the one who emphasized this evolutionary principle most effectively, while the Encyclopaedists did most to exemplify it.

(3) A science must be understood in relation to the human mind and its constitution. It is a product both of the human mind and of the phenomena that are studied, neither of which can be regarded as passive or neutral in the creation of a science. Any recommendations that are made through the procedures of political economy must also take account of the human mind and its natural propensities. This is the Humean thesis.

(4) A science, like a work of art, is a means of communicating. It will necessarily be related to the artistic taste of its creator, and it should be adapted to the understanding of the public who accept it and respond to it. Smith seems particularly indebted to D'Alembert and Rousseau, as well as to Shaftesbury and Hutcheson, for his recognition of the aesthetic and rhetorical aspects of a system of science.