FROM THE <u>HISTORY</u> <u>OF</u> <u>ASTRONOMY</u>
TO THE <u>WEALTH</u> <u>OF</u> <u>NATIONS</u>:
WONDERFUL WHEELS AND INVISIBLE HANDS
IN ADAM SMITH'S MAJOR WORKS

by

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ABSTRACT

This paper proposes a re-reading of Smith's major works pointing at induction as the common characteristic and unifying element of the *Theory of Moral Sentiments* and the *Wealth of Nations*. All the salient aspects of Smith's philosophical approach are already present in an earlier essay--*The History of Astronomy*--which, therefore, can be seen as the manifesto of his methodology.

Struck by a *wonderful* phenomenon, a philosopher's imagination struggles to reduce the discomfort of such a sublime experience to the beauty of a harmonious theoretical system. Philosophy is the art devoted to the discovery of the *efficient cause* that links together a series of disconnected objects in the observer's mind. Newton's gravity is the example that Smith refers to in his *History of Astronomy*.

We maintain that Smith's project was that of finding the equivalent of such a connecting principle in his investigation of ethics in the *Theory of Moral Sentiments*, as well as of economics in the *Wealth of Nations*.

The famous image of the *invisible hand* stands at once for the motivation of the inductive research and for the solution to the problem with which the philosopher is confronted. Far from being a kind of metaphysical Providence, the *invisible hand* is employed by Smith as a rhetorical device somewhat similar to the x the mathematician uses to indicate the unknown solution (which, perhaps, does not even exist) to some functional equation.

Given the multiplicity of interpretations allowed by the very nature of the *invisible hand*, we propose our own way of deciphering the latter in the specific context of the *Wealth of Nations*. We suggest that *self-interest*--with the meaning that Smith used to give to the expression--is the *efficient cause*, the equivalent to the gravitational principle which manages to reconcile the egotistical behaviour of each individual with the collective welfare.

Smile

From the <u>History of Astronomy</u> to the <u>Wealth of Nations</u>: Wonderful Wheels and Invisible Hands in Smith's Major Works[*]

> *From Zeus let us begin; him never do we men pass by*
> *In silence. Full of Zeus are all the streets,*
> *And all the market-places of men;...*
>
> Aratus

Introduction

This paper proposes a re-reading of Smith's major works in the light of his early and certainly less applauded essay tracing the history of astronomy from antiquity to the middle of the eighteenth century. The methodology employed to explain the evolution of these theories goes beyond the specific work and becomes Smith's own guideline in his overall philosophical investigation. Our analysis leads to an all-encompassing interpretation of the *invisible hand* as it appears in the *History of Astronomy*, *The Theory of Moral Sentiments*, and *The Wealth of Nations*. Smith uses the *invisible hand* as a rhetorical device, as an expression denoting an unknown value or functional form which solves the problem at stake. The number of interpretations of such a metaphor proposed in the literature reflects the implicit attempt at finding *the solution* to *the problem*. Hence, it should not be surprising that sometimes seemingly irreconcilable contradictions are considered the effect

of chance and as such dismissed, or otherwise settled at a metaphysical level. Smith, we maintain, believed in and applied induction in his philosophical investigation of ethics in the *Theory of Moral Sentiments*, as well as of economics in the *Wealth of Nations*. His goal was that of reducing *wonderful* phenomena to a well connected sequence of familiar objects following the infinite regression up to the first of the sensible (visible) causes.

In the first two sections we analyze Smith's methodology as presented in the *History of Astronomy*. Drawing a parallel between the sentiment of *wonder*--the basis of any philosophical investigation--and the concept of the *sublime* as theorized by Edmund Burke in 1757, we suggest that the acquisition of knowledge in Smith's major works is founded upon aesthetic categories. The third section gives a critical account of several interpretations of the invisible hand starting with those given by Viner (1926) and Robbins (1952) to conclude with the ones proposed by Ahmad (1990) and Davis (1990). Dissenting from these standpoints, we introduce our own position in the fourth section. The fifth section concludes the paper emphasizing the important implications that Smith's inductive approach may have for new research projects in economic theory.

1. Smith's wonder and Burke's sublime

The Principles which Lead and Direct Philosophical Enquiries; Illustrated by the History of Astronomy was published in 1795, after Adam Smith's death. However, a passage from this essay (HA)

provides a precious *terminus ante quem* which helps us identify the position of such a work in the chronology of Smith's literary career:

> His [Newton's] followers have, from his principles, ventured even to predict the returns of several of them [comets], particularly of one which is to make its appearance in 1758. (HA, IV.74)

Moreover, Smith inserts a footnote concerning Halley's comet, which clearly supports our assumption:

> It must be observed, that the whole of this Essay was written previous to the date here mentioned; and that the return of the comet happened agreeably to the prediction.

To be able to ascertain the date of the HA and to affirm, more specifically, that it precedes Smith's major works[1] is crucial to our present purposes, since we maintain that this essay is the *manifesto* of Smith's methodology. The very philosophical approach designed by Smith before 1758 will equally guide his investigations of ethics in *The Theory of Moral Sentiments* (TMS) and of economics in *An Inquiry into the Nature and Causes of the Wealth of Nations* (WN). Because of such a unique thread linking his works, the notorious "Adam Smith Problem" should cease to exist[2]. Actually,

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[1] Some evidence suggests that this essay was written even before Smith was appointed to the Chair of Logic in Glasgow in 1751. In his introduction to the *History of Astronomy*, Wightman commenting on a statement Smith makes on chemistry (HA, II.12), says: "Smith could hardly have written this in Glasgow, where William Cullen in 1748 began his epoch-making 'popularization' of chemistry..." Furthermore, in a letter Smith sent to Hume in 1773, he defines the *History of Astronomy* as a juvenile work. In support of this hypothesis, Macfie (1971) maintains that Smith would hardly call any essay written in Glasgow "juvenile".

[2] A thoughtful analysis of the debate on the consistency of Adam Smith's two major works, that took place toward the end of last century may be found in Onken (1897).

Smith himself never perceived any inconsistency within his whole project. In the *advertisement* to the seventh edition of the TMS, Smith writes that the WN partially accomplishes the original plan he had anticipated in the introduction to the first edition of the TMS, namely, that of giving an account of *general principles* of law and government.

In addition, the continuity of methodology and intents that we emphasize throughout the corpus of Smith's writings acquires further significance when related to similar projects of his time. Among the possible connections between Adam Smith and his contemporaries, we will examine one of the least exploited-- probably because it goes beyond the realm of economics to which Smith is usually confined--but, on the other hand, quite rich in implications.

In 1757 Edmund Burke published *A Philosophical Enquiry into the Origin of our Ideas of the Sublime and Beautiful*: the links that can be made between this book and Smith's *History of Astronomy* are very interesting and suggestive of a pervasive research program common to the period which we may indicate, on Smith's part, as the *Scottish Enlightenment*. To present Smith as a member of the Enlightenment and at the same time to associate him with one of the most outstanding theoretician of the violent passions arising from the sublime might at first seem contradictory. Nevertheless, we argue, on the one hand the Scottish Enlightenment is unquestionably less dogmatic than the orthodox tradition of the French *philosophes*; on the other, Burke himself only anticipates some

Romantic ideals, but still clings to a doctrine of moderation--of reform and not of revolution--both in philosophy and in politics. Therefore, both Smith and Burke can be seen as transitional thinkers who reflect the substantial cultural transformations occurring in Great Britain in the second half of the eighteenth century.

Some comparative studies of these two figures have been already accomplished--for example by Nicholson (1910), Dunn (1941), Fay (1960), as well as by Jacob Viner (1965) in his introduction to John Rae's *Life of Adam Smith*. However, they all stress the relation that existed between Smith and Burke when the latter was an active member of the Whig party. Instead, the parallel we propose is between Smith and Burke the philosopher and literary scholar rather than the politician.

It may be interesting to know whether Smith had read Burke's *Philosophical Enquiry* before writing the *History of Astronomy*, but we do not have any conclusive argument in this sense. Actually, the *Catalogue of the Library of Adam Smith* compiled by James Bonar (1932) records a copy of the *Philosophical Enquiry*, but it is already its ninth edition published in 1782. Furthermore, Burke wrote a review[3] of *The Theory of Moral Sentiments* after having received a copy of the book which David Hume had sent him. In his letter[4] to Smith to thank him for the present, Burke formulates the desire of "being made personally known to" him. However, beyond any

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[3] *Annual Register* 1759, pp. 484 ff.

[4] Quoted in Fay (1960), p. 10.

punctual distinction between precursor and epigone--which is not
the objective of this paper--we will be content with arguing that
the similarities in the concepts and ideas used by the two authors
are the result of their communal intellectual and historical
background.

The opening section of the *History of Astronomy* is devoted to
the definition and exemplification of three concepts: wonder,
surprise and admiration. As Smith explains,

> [w]hat is new and singular, excites that sentiment which,
> in strict propriety, is called Wonder; what is
> unexpected, Surprise; and what is great or beautiful,
> Admiration. (HA, Introduction, 1)

Wonder is the most relevant to our analysis. One cause of this
sentiment is the novelty or unfamiliarity of an object or
situation:

> The imagination and memory exert themselves to no
> purpose, and in vain look around all their classes of
> ideas in order to find one under which it may be
> arranged. They fluctuate to no purpose from thought to
> thought, and we remain still uncertain and undetermined
> where to place it, or what to think of it. It is this
> fluctuation and vain recollection, together with the
> emotion or movement of the spirits that they excite,
> which constitute the sentiment properly called
> *Wonder*...(HA II.3)

This description can be related to Burke's analysis of the sublime
and, in particular, to the effect that the sublime in its highest
degree has on the spectator:

> ... astonishment is that state of the soul, in which all
> its motions are suspended, with some degree of horror.
> [...] Hence arises the great power of the sublime, that
> far from being produced by them, it anticipates our
> reasonings, and hurries us on by an irresistible force.
> (PE part 2, sec I)

Smith recognizes a second important cause of Wonder, such as an

unfamiliar succession of objects:

> Such is the nature of this second species of Wonder, which arises from an unusual succession of things. The stop which is thereby given to the career of imagination, the difficulty which it finds in passing along such disjointed objects, and the feeling of something like a gap or interval betwixt them, constitute the whole essence of this emotion. Upon the clear discovery of a connecting chain of intermediate events, it vanishes altogether. What obstructed the movement of the imagination is then removed. (HA II.9)

Through the whole *History of Astronomy*, *imagination* is the faculty responsible for the connection of ideas, for the reduction of sensorial data to familiar categories. It is significant that Smith uses the word *imagination* rather than *reason*; the former does not only evoke the rational component of the mind that is involved in the process of "familiarization", but also intuition: in Smith's connotation of the term, imagination includes some sort of creativity. Not accidentally, the role that Smith attributes to such a faculty seems to anticipate the concept of *secondary imagination* as used by Coleridge in his *Biographia Literaria*,[5] when the Romantic movement is already in full swing. The secondary imagination, which according to the English poet coexists with the conscious will, "dissolves, diffuses, dissipates, in order to recreate," but where this is not possible, still "struggles to idealize and to unify." According to Smith, Philosophy should be counted precisely among those arts that address themselves to the imagination.

Philosophy is the science of the connecting principles of

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[5] Samuel Taylor Coleridge, "On the Imagination," *Biographia Literaria*, Ch 13.

nature. Nature, after the largest experience that common observation can acquire, seems to abound with events which appear solitary and incoherent with all that go before them, which therefore disturb the easy movement of the imagination.[...] Philosophy, by representing the invisible chains which bind together all these disjoint objects, endeavours to introduce order into this chaos of jarring and discordant appearances, to allay this tumult of the imagination, and to restore it [...] to that tone of tranquillity and composure, which is both most agreeable in itself, and most suitable to its nature. (HA II.12)

It may be argued that for a romantic artist imagination is the catalyst for creation, whereas for Smith it has the task to discover the links of a chain of events which--though perhaps not visible-- already exist as connecting principles or laws of nature. In this respect Smith is clearly a figure of the Enlightenment. On the other hand, some evidence equally suggests that Smith possesses a sort of historical relativism which prevents him from accepting any kind of dogmatism, no matter whether founded on Superstition, Religion or Reason. For instance, he writes the following lines about the history of the philosophy of nature:

Let us endeavour to trace it, from its first origin, up to that summit of perfection to which it is at present *supposed* to have arrived, and to which, indeed, it has *equally been supposed to have arrived in almost all former times.* (HA II.12. My emphasis)

Even though at various stages of human history the same question is asked, it will receive different answers according to the specific institutional framework and to the scientific knowledge attained.

2. Hidden Chains in Smith's Philosophy

Nevertheless, Smith's relativism does not hinder him from posing the existence of a universally valid epistemological tool.

By abstracting from the specificity of the various socio-cultural contexts, he attempts to explain the dynamics underlying any philosophical investigation. Actually, the latter is triggered by the sentiment of wonder which causes deep discomfort by preventing the smooth passage of the imagination between two seemingly disjointed observations. Smith, therefore, feels it necessary to found such an investigation upon a sentiment which is more powerful and persistent than mere curiosity. In this, again, we find an echo of Burke's analysis, according to which curiosity is "the most superficial of all the affections:[6]" and, even though its appetite is very sharp, it is also very easily satisfied. Burke maintains that the mind has to be affected by powers and passions other than curiosity to exert itself:

> But whatever these powers are, or upon what principle soever they affect the mind, it is absolutely necessary that they should not be exerted in those things which a daily and vulgar use have brought into a stale unaffecting familiarity. Some degree of novelty must be one of the materials in every instrument which works upon the mind. (PE, part I, section I)

Therefore, both authors agree on the role that novelty plays in arousing passions. Similarly, they both attribute a dampening effect to familiarity: for Smith, the latter is an obstacle to philosophical investigation since it prevents the feeling of wonder; for Burke, by inhibiting the production of the sublime, it deprives the mind of that peculiar pleasure that he defines as

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[6] PE, part I, section I.

Delight.[7] More significantly, Smith realizes that, if the insurgence of wonder or the production of the sublime are natural effects (since they are linked to the innate faculty of imagination) philosophy, on the other hand, is an artificial construct, which could blossom only after the "establishment of law, order, and security" (HA, III.1). Nevertheless, the uneasiness due to wonder can be solved by merely *supposing*[8] the existence of a train of familiar events which abridges the disconnected observations, thus allowing the smooth passage of the imagination. Anthropomorphic deities are created as a result of this very need to reduce to everyday experience some most irregular and terrifying occurrences. The acceptance of a superhuman power accounts for the grandiosity of the event; simultaneously, the earthly passions and feelings--which reveal the god's human component and to which the savage is mostly accustomed--can explain the irregularity and unpredictability of the wonderful phenomenon.

The same ideas about the nature and goals of philosophy emerge surprisingly with almost specular words, in the *Wealth of Nations* when Smith is stressing the importance of the education of youth:

> The great phenomena of nature [...] are objects which, as they necessarily excite wonder, so they naturally call forth the curiosity, of mankind to enquire into their causes. Superstition first attempted to satisfy this curiosity, by referring all those wonderful appearances to the immediate agency of the gods. Philosophy

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[7] "As I make use of the word *Delight* to express the sensation which accompanies the removal of pain or danger; so when I speak of positive pleasure, I shall for the most part call it simply *Pleasure*". (PE, part I, section IV)

[8] HA, II.8

afterwards endeavoured to account for them, from more familiar causes, or from such[9] as mankind were better acquainted with than the agency of the gods. (WN, BK V, CH I, PT III, ART II).

The philosopher is he who, because of some natural talent or of prolonged training, has developed a sensibility that makes him feel some incongruence, "some interval betwixt objects" where common people would not find any uneasiness. Smith offers the simile of the "nicer ear of the musician" which will find a want in rhythm and consonance "in those sounds which to the greater part of men seem perfectly agreeable to measure and harmony."[10] However, the philosopher has also the active role of finding the "invisible chain" to link seemingly disconnected occurrences. This concept is also presented and somehow generalized in the WN: "philosophers or men of speculation [...] are often capable of combining together the powers of the most distant and dissimilar objects"[11] to bring about the "improvements in machinery" which were never invented by those "who had occasion to use the machines."

This quotation suggests that the source and aims of Philosophy are not limited to the investigation of astronomy or of what Smith calls *natural philosophy*. Smith maintains that, since natural phenomena must have been the first ones to strike the imagination of mankind, this type of philosophy was the first one to emerge. However, *moral philosophy* is founded on similar principles, and

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[9] Another example of moderation and of historical perspective shown by Smith.

[10] HA, II.11

[11] WN, BK I, CH I.

addresses similar needs. In Smith's opinion, the fact of leading a social life necessarily made ˌindividuals conscious of the "characters, designs, and actions of one another," so that a number of "rules and maxims for the conduct of human life" was established. Later, the introduction of writing promoted the multiplication of such maxims, proverbs, apologues, fables. Eventually, after a similar exercise had been *beautifully*[12] accomplished by the essays dealing with natural philosophy,

> [t]he maxims of common life were arranged in some methodical order, and connected together by a few common principles, in the same manner as they had attempted to arrange and connect the phenomena of nature. The science which pretends to investigate and explain those connecting principles, is what is properly called moral philosophy. (WN, BK V, CH I, PT III, ART II)

It is important to stress that the links between the various moral sayings are to be found in a "few common principles". These connecting causes must be few in number for the sake of simplicity, but the adjective "common" hides some ambiguity. It can, first of all, be interpreted as implying some similar property among the elements of a subgroup of maxims, so that the "methodical order" here suggested would be simply the result of a classification;[13]

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[12] The term is not fortuitous since, at least implicitly, Smith is suggesting that "the *beauty* of a systematical arrangement of different observations" (WN, BK V, CH I, PT III, ART II) of natural phenomena was one of the causes for a similar exercise in morals.

[13] In Smith's opinion, classification is an important tool which accompanies advance in knowledge and experience. The example he refers to in *The History of Astronomy* (HA II.2) is that of botany. Smith, as is his habit, gives a very detailed account which may be somewhat familiar to the reader acquainted with the author's description of the pin factory in *The Wealth of Nations*. Since the philosopher is the one who has the ability to connect the characteristics of "distant" objects or ideas, it is not completely

however, Smith may as well have used "common" with the same connotation as in "common life", that is, with the meaning of "customary, familiar". Obviously, these two interpretations are not exclusive, rather, they complement each other since a researcher, in order to be successful in his philosophical investigation, must be acquainted with the categories under which he groups the objects he is examining. Only in this case will the imagination, once more, "glide smoothly" over the sequence of connecting objects that compose--or at least, are supposed to compose--the mechanism of nature.

The metaphor of the machine and its mechanism appears several times in Smith's works. In *The History of Astronomy*, the various systems created by the ingenuity of natural philosophers are "imaginary machine[s] invented to connect together in the fancy those different movements and effects which are already in reality performed" (HA, IV.19). Furthermore, an early system is as rude and complex as the first machine designed to produce a particular effect; but eventually the philosophical system is simplified in the same way in which a newer machine obtains the original effect "with fewer wheels." The *History of Astronomy* gives a detailed account of the evolution of the cosmological paradigms along this line. The Newtonian system is the latest and the most successful one at connecting the "phenomena of the Heavens" with only one

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absurd to hypothesize that the theory of the division of labor-- i.e. the idea of a much greater efficiency in production which derives from the recognition of a variety of particular tasks within a single process-- was suggested to him by his "distant" knowledge of classification in botany.

common principle. Among all the qualities of matter (after its inertness), gravity is indeed the one "which is most familiar to us" (HA, IV.76). However, in *the Theory of Moral Sentiments* there seems to be a shift in the use of such imagery: the universe itself becomes the great machine endowed with "secret wheels and springs" (TMS, I.i.4.2). We might hurriedly interpret this change in emphasis as an involution, as a return to the key-metaphor of the Enlightenment project, namely, that of a mechanistic world. Nevertheless, Smith reinstates the meaning proposed in the HA by depicting human society as "a great, an immense machine" only because "we contemplate it in a certain abstract and philosophical light" (TMS, VII.iii.1.2). Once again, it is the theoretical model of reality and not reality itself which functions according to mechanistic relations.

This is not the only point of departure from the canonical principles of the Enlightenment. The most famous of Smith's metaphors--that of the *Invisible Hand*--reinforces precisely the notion of an organic universe to the detriment of a mechanistic one. As a synecdoche for a living body, the hand points at the need for connections between disjointed, and thus wonderful, events in a world already rich in Romantic nuances.

2. The conjuring trick of the Invisible Hand

The image of the invisible hand has captured the attention and aroused the interest of generations of economists, and is usually taken as a synonym for the *laissez-faire* doctrine. For Jacob Viner

(1926), Smith's main originality was that of introducing into economics the "concept of a unified natural order, operating according to natural laws, and if left to its own course producing results beneficial to mankind."[14] Philosophers and theologians had already made the same attempt for the world in general. Some of them--among whom Smith's teacher Hutcheson--had extended the approach to the economic realm, at least sketchily. According to Viner, then, Smith took an important further step in analyzing the economic process at large with the explicit purpose of "discovering the nature of the order which underlay its surface chaos." He was trying--to employ the same terminology adopted in the *History of Astronomy*--to find the connecting principles that would allow the imagination to move smoothly along the sequence of those most wonderful phenomena.

In *The Theory of Moral Sentiments* the harmonious order of nature was the effect of a divine guidance, whereas, in *The Wealth of the Nations*, this benevolent deity is almost completely absent. In the latter work, harmony is the result of more familiar causes, so that Smith "is free to find defects in the order of nature without casting reflections of the workmanship of its Author."[15] Hence, the *Harmonielehre* of the TMS is universal, but in the WN "it is as a rule a sort of average or statistical harmony"[16] which allows for cases in which a generally beneficent effect may be

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[14] Viner (1926), p. 118.

[15] Viner (1926), p. 127.

[16] Viner (1926), p. 128.

detrimental to some individual. In this respect, Viner sees the invisible hand in the *Theory of Moral Sentiments* as one of Smith's many synonyms for "the great Director of Nature", "the all-wise Author of Nature", expressions that stress the role played by the beneficent deity. However, in the *Wealth of Nations*, the invisible hand is just an isolated reference and a much too weak piece of evidence in favour of a complete reconciliation of the "doctrines expounded in the two works."[17]

Viner correctly interprets the WN as Smith's lay attempt at explaining economic phenomena. Hence, the irreconcilability of the two books stems from the fact that Viner considers the TMS almost a "religious" work. An interesting experiment, however, would be to try a comparison of both books from a lay perspective. After the publication of the TMS, David Hume wrote a letter to Smith to congratulate the author on the editorial success that the book was already having. In a humorous phrase, after announcing the great favour encountered by the book among several bishops and clergymen, Hume says that the work will not be received positively by the "true Philosophers[...] when these Retainers to Superstition praise it so highly."[18] It is not so obvious that the TMS was designed to be an apology of Christian morality. The book was originally based on a series of lectures that Smith was giving in Glasgow, and the class he was addressing included a large portion of pupils destined

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[17] Viner (1926), p. 127.

[18] Letter 31, April 12 1759. Partially quoted in the Introduction to *The Theory of Moral Sentiments*, D.D. Raphael and A.L. Macfie editors, 1982 Liberty Press.

to the Church. However, James Wodrow, who had attended those lectures, wrote:

> [Smith's] Theory of Moral Sentiment founded on sympathy, a very ingenious attempt to account for the principal phenomena in the moral world from this one general principle, *like that of gravity in the natural world*, did not please Hutcheson's scholars so well as that to which they had been accustomed. The rest of his lectures were admired by them and by all especially those on Money and Commerce, which contained the substance of his book on the *Wealth of Nations*....[19]

However simplistic, Wodrow's view adds some evidence in favour of the hypothesis that Smith had embarked in one grand enterprise. He wanted to reduce to a series of familiar causal or logical relations those phenomena of the social realm that had aroused his curiosity. One of Smith's *Lectures on Rhetoric* confirms the pivotal role of the Newtonian methodology in Smith's explanation of reality. Comparing it with the Aristotelian method, he considers Newton's approach "the most Philosophical, and in *every science* [...] vastly more ingenious."[20] It is not only on the cognitive level, but also on the aesthetic one that Smith extols Newton over Aristotle:

> It gives us *pleasure* to see the phenomena which we reckoned the most unaccountable all deduced from some principle (commonly a wellknown one) and all united in one chain...(LR ii.134)

Therefore Smith's own investigation from natural philosophy to social science can be seen as a search for some equivalent to the

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[19] As quoted in the Introduction to *The Theory of Moral Sentiments*, D.D. Raphael and A.L. Macfie editors, 1982 Liberty Press. My emphasis.

[20] *Lectures on Rhetoric* (LR), ii.133. My emphasis.

gravitation principle that could explain how, in general, a moral judgement may emerge from self-loving individuals or that could justify a society based on division of labor and on exchange, and yet composed of self-interest seeking agents.

As noted by Viner, Smith's work was part of the project of his time, and the parallel can still be made with Burke's study of the beautiful and the sublime. In particular, Burke explicitly states that he is looking for the equivalent of attraction as an *efficient cause*. He is seeking "certain affections of the mind, that cause certain changes in the body; or certain powers and properties in bodies, that work a change in the mind."[21] This *efficient* cause is strictly related to the immediately sensible qualities of things; it is not the *first* cause which, on the other hand, would force us to entertain some metaphysical discourse beyond our understanding.

> When Newton first discovered the property of attraction, and settled its laws, he found it served very well to explain several of the most remarkable phenomena in nature; but yet with reference to the general system of things, he could consider attraction but as an effect, whose cause at that time he did not attempt to trace.
> (PE, Part IV, Section I)

Smith, the philosopher, was mainly interested in these *efficient* causes and followed the same inductive methodology that he had praised so highly in the *History of Astronomy*, in the TMS, as well as in the WN. This is, in our opinion, the common thread linking the different works of the Scottish author. Viner (1928), however, stresses that induction is the methodology used mainly in the WN, and that it is employed there to find a natural harmony making

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[21] Edmund Burke, *A Philosophical Enquiry*, Part IV, Section I.

inference from specific data rather than assuming its existence from metaphysical beliefs as in the TMS. Therefore, the "invisible hand" of the WN is nothing more than a relic of the superimposed divine harmony of the previous work. It should be simply considered as a *lapsus linguae*, although unfortunate, and should be dismissed as such without much consequence for the correct reading of Smith's major work.

Lionel Robbins (1952) follows approximately the same line of reasoning proposed by Viner. However, he takes it one step farther to state that the harmony of the system described in the WN is very limited and depends on certain preconditions. In particular, the government must not favour any subsection of society, and the market has to function freely without the constraints imposed by monopolies or other market imperfections. Only in this case will the individual self-interest be brought into line with the common good. Smith is in line with the other Classical Economists when he considers harmony as "never...arising in a vacuum but always very definitely within a framework of law."[22] The legal framework that Robbins is advocating must be a precondition: it is logically--if not chronologically--anterior to the recommendation of economic freedom. What is the role of the invisible hand in this picture?

> [It] is not the hand of some god or some natural agency
> independent of human effort; it is the hand of the law-
> giver, the hand which withdraws from the sphere of the
> pursuit of self-interest those possibilities which do not
> harmonize with the public good.[23]

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[22] Robbins (1952), p. 191.

[23] Robbins (1952), p. 56.

Robbins's *market-plus-framework* approach, as Warren Samuels (1966) calls it, is founded upon a static notion; the idea of a framework involves a truism to discriminate what is part of it from what remains out of it. Furthermore, every aspect of a social structure within which interactions take place must be considered part of this framework. Self-interest seeking individuals act in a habitat where the best rules of the game have been written by this benevolent law-giver (a dictator?), and efficient institutions are in place. There is no evolution of the structure and no attempt is made at explaining why these laws and institutions should emerge from the original anarchy.

Samuels (1966) criticizes Robbins's interpretation mainly for three reasons. First of all, no attention is paid to nonlegal aspects of social interaction; second, the role of the government in establishing or maintaining the framework is not completely specified; third, the classical view of the law as an instrument or mode of change is not correctly characterized. As far as the first criticism is concerned, we must agree that such nonlegal forces as morals, religion, customs, are an essential components of the social fabric, and Smith was certainly aware of them. He had already stressed the importance of custom in part V of the TMS, and in the WN itself he devotes an important part of book V to the institutions designated to the education of the young. Robbins well recognizes that government participation is necessary to the success of the *laissez-faire* system, and that the state is an important agent in the economic decision-making process; yet, he

does not explicitly analyze its framework-provision functions. In particular, Samuels points at two such functions: that of establishing the spheres of competence of the public and private sectors, and that of structuring the private decision-making participation. However, he maintains that

> [l]egislation (via court and parliament) was a mode of determining the scope of legislation and the role of government, and thereby, also, the overall division of power...[24]
> Law thus participated in the determination of its own scope, and in the scope and role of private enterprise *writ large*.[25]

It is clear that Samuels is here complementing or making Robbins's interpretation more precise rather than presenting a serious criticism; in fact, the stress is once more on the legal aspects of the framework even though at a meta-level. The third point of dissent that Samuels expresses is centered on the immutable nature of the market-plus-framework hypothesis as proposed by Robbins. As noted above, his analysis is synchronic and therefore does not consider the possibility of a clash of interest between groups of agents feeding back to the institution design process. Rather than being guided by an invisible and infallible hand, the law-giver closely resembles the Walrasian auctioneer who, in this case, records the excess discontent and gropes towards a social equilibrium. Simultaneously, non-legal institutions are born, evolve and disappear in a similar trial-and-error process. Hence, the idea of an *invisible hand*, as a pre-existent order, was

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[24] Samuels (1966), p. 103.

[25] Ibid., p. 107. Sic.

> epistemologically either mere assertion or hypothesis.
> The history of subsequent economic thought may be viewed
> as efforts aiming at the specification of the conditions
> of mutuality or harmony of interests.[26]

If Robbins was interested in describing a *status quo*, Samuels shifts the attention to the need for a continuous *recreation* of harmony. However, he does not try to isolate the *efficient cause* that first led to the creation of the original institution; he does not look for the gravitational principle that could bring together a social organization.

Viner's, Robbins's and Samuels's treatments of the *invisible hand* are based on an analysis of this expression as it appears in the TMS and in the WN. Smith, however, had already used such a metaphor in a previous occasion, namely, as the "invisible hand of Jupiter" in the *History of Astronomy*. As noted above, this essay was published posthumously in 1795, but had probably been written before 1758, prior to the TMS. Alec Macfie (1971) is apparently the first[27] who calls attention to this early passage and compares it with the later uses that Smith makes of it. The original passage reads:

> For it may be observed, that in all Polytheistic
> religions, among savages, as well as in the early ages of

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[26] Samuels (1958), p. 2.

[27] Jacob Viner (1928), however, quotes a passage from the *History of Ancient Physics* which is one of the essays on *The Principles which Lead and Direct Philosophical Enquiries*. The *History of Astronomy* is part of the same work and precedes only by few pages that on the *History of Ancient Physics*. It is strange that such a peculiar phrase did not capture the attention of an otherwise very meticulous scholar as Viner. It is more reasonable to assume that Viner believed the expression to be only accidental and therefore not worth mentioning.

> Heathen[28] antiquity, it is the irregular events of nature only that are ascribed to the agency and power of their gods. Fire burns, and water refreshes; heavy bodies descend, and lighter substances fly upwards, by the necessity of their own nature; *nor was the invisible hand of Jupiter ever apprehended to be employed in those matters*. But thunder and lightning, storms and sunshine, those more irregular events, were ascribed to his favour, or his anger. (HA, III.2, my emphasis)

According to Macfie, "Smith.... enjoyed pithy, forceful phrases"[29] so when he was writing the *Theory of Moral Sentiments* he remembered the metaphor and employed it, this time, to "express *his own* view as to the relation between divine guidance, the system of nature, and human behavior."[30] In fact, the role that the invisible hand plays in the two early works is reversed. Heathen gods act as to disturb, thwart, and stop the ordinary course of things, whereas in the TMS, as well as in the WN, "the Deity acts to preserve and develop the purposes of 'Nature' when they are disturbed by men."[31]

> [The rich] consume little more than the poor, and in spite of their natural selfishness and rapacity,[...] they divide with the poor the produce of all their improvements. They are led by an invisible hand to make nearly the same distribution of the necessaries of life, which would have been made, had the earth been divided into equal portions among all its inhabitants, and thus without intending it, without knowing it, advance the

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[28] In Lingren (1967), p. 49, the expression is "Heavenly antiquity". According to Davis (1990), Smith is "suggesting that Judaism evolved from a polytheistic animism"(note 10, p. 343); this may be the reason why the essay was not published when Smith was still alive. We simply believe that this version is a typographical mistake. Smith wants to distinguish between "savages" and the Greeks or Romans (*Heathen* antiquity) that he could not consider mere savages.

[29] Macfie (1971), p. 598.

[30] Ibid.

[31] Macfie (1971), p. 596.

interest of the society...(TMS IV.I.10)

> [Every individual] generally, indeed, neither intends to promote the public interest, nor knows how much he is promoting it. By preferring the support of domestic to that of foreign industry, he intends only his own security; and by directing that industry in such a manner as its produce may be of the greatest value, 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. (WN, BK IV, CH II)

Macfie's reading is religious and supports the metaphysical interpretation of the metaphor. However, his comment on a different function attributed to, or role played by, the invisible hand has been the first in a series of articles reviving the interest for this particular aspect of Smith's literary production.

Syed Ahmad (1990) recognizes four different invisible hands, possibly reducible to one "Invisible Power." Ronnie Davis (1990) proposes that the reconciliation between individual and social interest is performed by a sleight of hand, suggesting, perhaps, that the invisible hand is nothing but a conjuring trick. Macfie (1971) himself maintains that the nuance contained in the expression as it appears in the TMS is somewhat different from that of the WN: the former refers to distribution and the latter to maximization of wealth. Joseph Persky (1989) seems content to define the invisible hand simply as Adam Smith's simile for the market system[32] even though the title of his piece is "Adam Smith's Invisible Hands."

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[32] Persky, however, stresses the importance of *security* "as much part of the invisible hand mechanism as the basic desire for profit"(p. 198). Hence, this paper can as well be classified among those in favor of the *market-plus-framework* hypothesis.

4. The invisible hand: una, nessuna, centomila.

The question has not changed: what is it?. The title of a novel by Luigi Pirandello, *Uno, Nessuno, Centomila* (*One, None, and One Hundred Thousand*) seems appropriate to characterize the riddle of the invisible hand. One: Smith employs the same metaphor in three different occasions. None: after all, the hand is invisible. One Hundred Thousand: as many different interpretations have been given for it as there have been serious scholars investigating it. Does the puzzle have a solution? Once more, of course, God may be the easy way out, but we believe there is another option which satisfies the constraints.

In the first section of this paper, we have tried to show the mechanism that, according to Smith, leads to the accumulation of knowledge. The *imagination* is disturbed, thwarted, and stopped by the occurrence of a *wonderful* event. This state of the mind is so unbearable that it may cause lunacy and delusion: this is Burke's notion of sublime with terror. The only way to end the "vain recollection" of the memory and imagination is to abridge or to fill the gap in order to allow the smooth passage along those that once were so "different objects." The bridge is given by an explanation or, as we stressed above, by the mere supposition of an explanation. When a conjuring trick is performed for the first time, we *know* it is just a trick and that it can be easily explained: perhaps, we are satisfied by recalling the saying "the hand is faster than the eye." In sections II and III of the *History of Astronomy* the adjective *invisible* emerges nine times in about

nine pages. In particular, when *Wonder* is analyzed from a "modern" philosophical perspective, the expressions used are: "chain of intermediate, though *invisible* events," "invisible effluvia," "chain of invisible objects," "*invisible* chains." On the other hand, in the section devoted to describe the origin of philosophy, the word *invisible* appears in "intelligent, though *invisible* causes," "invisible and designing power," "intelligent, though invisible beings," "invisible hand of Jupiter." The last time it is adopted, it reconciles the different uses with the original lay connotation of *hidden, unknown*. In fact, the members of a somewhat developed society will become "more desirous to know what is the chain that links" together some irregular phenomena, and the level of strength and security they have reached

> renders them less disposed to employ, for this connecting chain, those *invisible beings* whom the fear and ignorance of their rude forefathers had engendered. (HA, III.3, my emphasis)

The "hidden chains of events," "the invisible chain," and "the invisible hand of Jupiter" all stand for the want of an explanation.

We believe that Macfie is right when he says that Smith later remembered the expression and employed it on purpose. He used *the invisible hand* as a modern scientist would use *x* to denote the unknown--and not necessarily knowable--solution of a functional equation: it is just a rhetorical device. This is the other possible way to solve the riddle. One: the rhetorical phrase is

always the same. None: it is just a signifier,[33] an empty box to be filled with meaning. One Hundred Thousand: the plethora of solutions to different problems at hand.

Why is there an implicit idea of harmony and order when the expression is adopted in the TMS and the WN, but it is definitely lacking in the HA? It is because the notion of an *acceptable* explanation, the set of admissible solutions, has changed over time. In the *History of Ancient Physics*, Smith traces this evolution. He writes that "in the first ages of the world,[...] the idea of a universal mind,... who originally formed the whole, and who governs the whole by *general laws*"[34] was extraneous to mankind, but was later accepted

> by those philosophers, when, upon a more attentive survey, they discovered, or *imagined they had discovered*, more distinctly, the chain which bound all [nature's] different parts to one another. (HAP, 9, my emphasis)

The *invisible hand* is something that makes wonder disappear, thus allowing the disturbed imagination to rest once more. However, if the wonder arises in the savage as a result of some strange, peculiar event and dissolves with the ad hoc "explanation"--no matter how contradictory with respect to the explanation of another similar event--of an invisible and intelligent being, later the philosopher will not be satisfied. He will not manage to get rid of the wonder until he finds a logical chain of events which makes the

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[33] We employ "signifier" according to the definition given by the linguist Ferdinand de Saussure, namely, that of an acoustic image as opposed to the "signified" which corresponds to the concept underlying the word.

[34] *History of Ancient Physics*, 9.

irregular observation fit into a harmonic system.

In the *History of Astronomy*, the savage, struck by a wonderful phenomenon, invokes the invisible hand; however, the rich in the *Theory of Moral Sentiments*, and the "investor" in the *Wealth of Nations* are unconscious agents led by the invisible hand to promote the general welfare. Also from this perspective there seems to be an inconsistency, but it is easily solved. The alter ego of the savage terrified by a lightning is not the self-loving agent of the TMS or of the WN; rather it is Smith himself. In the same way in which the scared primitive tries to give himself a "reason" for the irregular event, Smith the philosopher is full of wonder when he considers that a complex society can work reasonably well in spite of the fact that each of its members explicitly seeks only his/her own interest. Hence, Smith has set for himself a problem whose solution--let us call it *x*, or, why not, *invisible hand*[35]--will reconcile individual egotistical actions with a higher level of harmony.

This paper would not be complete if we did not try to give *our* solution to the problem, just to make it one hundred thousand *and one*. As we stated above, Smith's set of admissible solutions is composed of *efficient* causes which, in Burke's definition, are the closest to the *first* cause without entertaining any metaphysical discourse. Burke points at the Newtonian gravitational principle as

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[35] As stressed above, the problem may be represented by a *functional* equation whose solution is a function, i.e., a rule and not simply a value. Therefore, the *invisible hand* may stand for such an unknown rule.

an example of such an efficient cause, gravity being an observable phenomenon which becomes the foundation of a coherent philosophical system. Smith, on his part, praises the Newtonian system as the only one which drew him insensibly "to make use of language expressing [its] connecting principles, as if they were the real chains which Nature makes use of to bind together her several operations."[36] As far as the problem at hand is concerned, Robbins (1952) stressed the importance of the market, and of institutions in general, in limiting the individual to exercise his/her freedom in the pursuit of such objectives that could be reconciled with the common good. Samuels (1966) complemented this view by arguing that harmony is the dynamical result of a dialectical process involving institution design and historical contingencies. However, the original problem remains; the efficient cause has not been explicitly isolated.

Let us rephrase the question: what is it that makes individuals band together as the first example of an institution? What else if not *self-interest*? An important step in this direction is taken by John McCall (1991) in a paper on Giambattista Vico, an Italian philosopher and one of Smith's contemporaries. McCall writes:

> Any serious study of the economics of uncertainty must consider the evolution of institutions as a major source of uncertainty reduction [...] The reduction of uncertainty occurs because institutions guide information flows and improve induction by the mind and society, with a corresponding enhancement of predictability. Institutions not only reduce uncertainty and generate

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[36] *History of Astronomy*, IV.76.

specialization, regularity and civility. They also harbor
the ethical qualities distinctive to humanity.[37]

Institutions are a source of "uncertainty reduction," not only
because they offer security in the form of law and police, but also
because they provide a very regular, hence predictable,
environment. This allows each individual to concentrate on those
activities that he/she can perform best because of natural talents
or acquired skills. In particular, Smith was stressing the division
of labor as

> the necessary, though very slow and gradual, consequence
> of a certain propensity in human nature [...]; the
> propensity to truck, barter, and exchange one thing for
> another. (WN, BK I, CH II)

However, how could these institutions arise if not because each
member gave up part of his/her freedom in order to benefit from the
uncertainty reduction the institution could offer? What is this if
not self-interest, again?

5. Conclusion

The *Theory of Moral Sentiments* and the *Wealth of Nations* are
parts of a single project that Smith--as he states in the
advertisement to the seventh edition to the TMS--had initially
planned to complete in his life time. The leading thread is given
by the methodology he employs in each case: induction. This crucial
aspect of Smith's philosophy is not sufficiently stressed in the
contemporary literature which, dealing with coordination and policy
issues, rather invokes Adam Smith as the prominent theorist of the

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[37] McCall (1991), pp. 2-3.

laissez faire doctrine. General Equilibrium models seem to have solved the theoretical riddle of the invisible hand by attributing to prices the power to coordinate a decentralized economy characterized--as first approximation--by complete and perfect markets. However, these models are based on deduction, which is typical of the neoclassical paradigm. Since the economic theory emerging from this tradition is often criticized for being far apart from everyday experience, we welcome a renewed and well-informed interest in Adam Smith's methodology, one which starts precisely with observed phenomena in order to build a connected and coherent theoretical system.

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