ADAM SMITH

III

Essays on Philosophical Subjects
with
Dugald Stewart's Account of Adam Smith

THE GLASGOW EDITION OF THE WORKS AND CORRESPONDENCE OF ADAM SMITH

Commissioned by the University of Glasgow to celebrate the bicentenary of the Wealth of Nations

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The Glasgow Edition of the Works and Correspondence of Adam Smith and the associated volumes are published in hardcover by Oxford University Press. The six titles of the Glasgow Edition, but not the associated volumes, are being published in softcover by Liberty Fund.

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Essays on Philosophical Subjects

EDITED BY

W. P. D. WIGHTMAN AND J. C. BRYCE

WITH

Dugald Stewart's Account of Adam Smith

EDITED BY

I. S. ROSS

GENERAL EDITORS

D. D. RAPHAEL AND A. S. SKINNER

Liberty Fund

INDIANAPOLIS

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Liberty Fund, Inc.
8335 Allison Pointe Trail, Suite 300
Indianapolis, Indiana 46250-1684

This reprint has been authorized by the Oxford University Press.

Library of Congress Cataloging in Publication Data

Smith, Adam, 1723–1790.
Essays on philosophical subjects.

Reprint. Originally published: Oxford [Oxfordshire]: Clarendon Press, 1980. (The Glasgow edition of the works and correspondence of Adam Smith; 3)
Includes bibliographical references and index.
I. Steward, Dugald, 1753–1828. Account of the life and writing of Adam Smith, 1982. II. Wightman, W. P. D. (William Persehouse Delisle) III. Bryce, J. C. IV. Ross, Ian Simpson. V. Title. VI. Series: Glasgow edition of the works and correspondence of Adam Smith; 3.
AC7.S59 1976a, vol. 3 330.15′3s 82-7121
ISBN 0-86597-023-8 (pbk.) [192] AACR2
P 10 9 8 7 6

This book is printed on paper that is acid-free and meets the requirements of the American National Standard for Permanence of Paper for Printed Library Materials, Z39.48-1992. ♾

Cover design by JMH Corporation, Indianapolis, Indiana
Printed and bound by Worzalla Publishing Company, Stevens Point, Wisconsin

Preface

THIS is Volume III of the new edition of the *Works and Correspondence* of Adam Smith undertaken by the University of Glasgow. It contains the *Essays on Philosophical Subjects* and Dugald Stewart's 'Account of the Life and Writings of Adam Smith', together with Smith's contributions to the *Edinburgh Review* and his Preface to William Hamilton's *Poems on Several Occasions.*

The range of subjects covered in this collection is too wide to be edited by any one scholar. The main task of dealing with the essays that are strictly on 'philosophical subjects' was entrusted to W. P. D. Wightman. The editors for the remaining pieces were chosen with an eye to their role in the preparation of other, related, volumes. John Bryce, the editor of the *Lectures on Rhetoric*, has therefore dealt with the essay on 'English and Italian Verses', the articles in the *Edinburgh Review*, and the Preface to Hamilton's *Poems*, while Ian Ross, Smith's biographer and (with E. C. Mossner) editor of the *Correspondence*, has looked after Stewart's 'Account'.

It was also thought desirable to appoint general editors in order to ensure uniformity of practice and to relate the different parts of this volume to each other and to the edition as a whole. We have tried to do so by providing a General Introduction and a number of supplementary notes (enclosed within square brackets). For much of the information in these notes we are indebted to several scholars, including P. Michael Brown, John Bryce, Eric Forbes, A. Rupert Hall, and Donald Malcolm. We owe a special debt to the late Donald Allan, formerly Professor of Greek in the University of Glasgow, for his extensive and invaluable help in dealing with classical sources; many of the supplementary notes concerned with the ancient world have been supplied by him in their entirety.

We should also like to thank Mrs. Theresa Campbell, Mrs. Julie Milton, and Miss Eileen O'Donnell for the care with which they have prepared the typescript at different stages.

1978

D. D. R.
A. S. S.

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Key to Abbreviations and References

WORKS OF ADAM SMITH

Corr.	*Correspondence*
EPS	*Essays on Philosophical Subjects*, included among which are:
Ancient Logics	'The History of the Ancient Logics and Metaphysics'
Ancient Physics	'The History of the Ancient Physics'
Astronomy	'The History of Astronomy'
English and Italian Verses	'Of the Affinity between certain English and Italian Verses'
External Senses	'Of the External Senses'
Imitative Arts	'Of the Nature of that Imitation which takes place in what are called the Imitative Arts'
Stewart	Dugald Stewart, 'Account of the Life and Writings of Adam Smith, LL.D.'
Languages	*Considerations Concerning the First Formation of Languages*
TMS	*The Theory of Moral Sentiments*
WN	*The Wealth of Nations*
LJ(A)	*Lectures on Jurisprudence*, Report of 1762–3
LJ(B)	*Lectures on Jurisprudence*, Report dated 1766
LRBL	*Lectures on Rhetoric and Belles Lettres*

References to Corr. give the number of the letter (as listed in the volume of Smith's *Correspondence* in the present edition), the date, and the name of Smith's correspondent.

References to LJ and LRBL give the volume (where applicable) and the page number of the manuscript (shown in the printed texts of the present edition). References to LJ(B) add the page number in Edwin Cannan's edition of the *Lectures on Justice, Police, Revenue and Arms* (1896), and references to LRBL add the page number in John M. Lothian's edition of the *Lectures on Rhetoric and Belles Lettres* (1963).

References to the other works listed above locate the relevant paragraph, not the page, in order that any edition may be consulted (in the present edition, the paragraph numbers are printed in the margin). Thus:

Astronomy, II.4	=	'History of Astronomy', Sect. II, §4
Stewart, I.12	=	Dugald Stewart, 'Account of the Life and Writings of Adam Smith', Sect. I, §12
TMS I.i.5.5	=	*The Theory of Moral Sentiments*, Part I, Sect. I, Chap. 5, §5
WN V.i.f.26	=	*The Wealth of Nations*, Book V, Chap. i, sixth division, §26

OTHER WORKS

Essays on Adam Smith	*Essays on Adam Smith*, edited by Andrew Stewart Skinner and Thomas Wilson (1975)

Rae, *Life*	John Rae, *Life of Adam Smith* (1895)
Scott, *ASSP*	William Robert Scott, *Adam Smith as Student and Professor* (1937)

General Introduction[1]

I

MOST of the essays contained in this book were not prepared for the press by Smith. They are fragments in fact—perhaps, as Black and Hutton suggested in the 'Advertisement' to EPS, parts of 'a plan he had once formed, for giving a connected history of the liberal sciences and elegant arts'. The essays are also diverse both in terms of subject-matter and in the degree of finish they had acquired at the time of Smith's death. Yet, at the same time, there are some common elements.

To begin with, the more important of the essays plainly have a 'philosophical' character, which conforms to Smith's own recommendations regarding the organization of scientific discourse. Smith believed that writers of 'didactical' discourse ought ideally to deliver a system of science by laying down 'certain principles, known or proved, in the beginning, from whence we account for the several phaenomena, connecting all together by the same chain' (LRBL ii.133, ed. Lothian, 140). Smith described this as the 'Newtonian' method, while well aware that it had been used before Newton—most notably by Descartes. This point in itself is an important reminder that Smith drew an implicit distinction between the method used in *expounding* a system of thought and that employed in *establishing* such a system: in the former case, he was able to point out that Descartes and Newton shared a common approach; in the latter, he insisted that the Cartesian sytem was 'fanciful', 'ingenious and elegant, tho' fallacious' (Letter to the Authors of the *Edinburgh Review*, § 5).[2] In short, the task of *establishing* a system of thought must be conducted in terms of the combination of reason *and* experience—although even here he was quick to associate this definition of the term 'method' with Galileo rather than Newton (Astronomy, IV.44).

[1] For a related account of the views expressed in Sections I–IV of this Introduction, see A. S. Skinner, 'Adam Smith: Science and the Role of the Imagination', in W. B. Todd, ed., *Hume and the Enlightenment* (1974). Much of Section V is drawn from part of a paper by D. D. Raphael previously printed (under the title '"The true old Humean philosophy" and its influence on Adam Smith') in G. P. Morice, ed., *David Hume: Bicentenary Papers* (1977) and now reproduced by permission of the Edinburgh University Press.

[2] Smith has been seen by some commentators to have had something of a preoccupation with Descartes. See, for example, S. Moscovici, 'A propos de quelque travaux d'Adam Smith sur l'histoire et la philosophie des sciences' in *Revue d'Histoire des Sciences et de leurs Applications*, ix (1956), section 3.

Secondly, it is at least broadly true that many of the essays provide evidence of Smith's concern with the principles of human nature, again, a wide-ranging interest. For example, Smith himself was to point out that under some conditions the study of grammar could provide the 'best History of the natural progress of the Human mind in forming the most important abstractions upon which all reasoning depends',[3] and John Millar explained his teacher's choice of emphasis in the LRBL by reference to Smith's belief that: 'The best method of explaining and illustrating the various powers of the human mind, the most useful part of metaphysics, arises from an examination of the several ways of communicating our thoughts by speech, and from an attention to the principles of those literary compositions which contribute to persuasion or entertainment.' (Stewart, I.16.) In the same vein, Dugald Stewart suggested that Smith's cultivation of the Fine Arts was developed: 'less, it is probable, with a view to the peculiar enjoyments they convey, (though he was by no means without sensibility to their beauties,) than on account of their connection with the general principles of the human mind; to an examination of which they afford the most pleasing of all avenues' (Stewart, III.13).

Finally, we should recall Smith's overriding interest in historical questions and the fact that 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' (Stewart, II.52). Earlier, Stewart had commented on Smith's youthful interest in mathematics[4] and the natural sciences, together with the principles of human nature, both of which: 'enabled him to exemplify some of his favourite theories concerning the natural progress of the mind in the investigation of truth, by the history of those sciences in which the connection and succession of discoveries may be traced with the greatest advantage' (Stewart, I.8).

While the features outlined above are all characteristic of the major essays in this volume, they are combined in one of them to greatest effect—the Astronomy, once described by J. A. Schumpeter as 'the pearl of the collection'.[5] While the essay is one of the best examples of theoretical history, it is perhaps most remarkable as a study of those principles of human nature which 'lead and direct' philosophical inquiry.

[3] Letter 69 addressed to George Baird, dated Glasgow, 7 February 1763.

[4] Interestingly enough, it is remarked in TMS IV.2.7 that: '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.'

[5] *History of Economic Analysis* (1954), 182.

II

One of the characteristics of theoretical history is that it may be applied to situations where direct evidence is lacking. As Stewart put it: 'In this want of direct evidence, we are under a necessity of supplying the place of fact by conjecture; and when we are unable to ascertain how men have actually conducted themselves upon particular occasions, of considering in what manner they are likely to have proceeded, from the principles of their nature, and the circumstances of their external situation.' (II.46.) In the context of the discussion of the *origin* of philosophy, Smith had comparatively little to say about man's external situation, but he did note that philosophical effort could only take place under conditions where subsistence was no longer precarious and where social order and a regular subordination of ranks were established (Astronomy, III.1,5).[6] Elsewhere he also noted the importance of language as a means of expressing ideas while pointing out that language[7] itself developed by virtue of man's intellectual capabilities—for example, his capacity for abstraction and generalization in addition to speech itself.

Given the above conditions, the assumptions employed are fundamentally simple: Smith assumes that *all* men are endowed with certain faculties and propensities such as reason, reflection, and imagination, and that they are motivated by a desire to acquire the sources of pleasure and avoid those of pain. In this context pleasure relates to a state of the imagination: the 'state of . . . tranquillity, and composure' (Imitative Arts, II.20). Such a state, Smith suggested, may be attained even where the objects contemplated are unlike or the processes involved are complex—provided only that the connection is a customary one. He added that the 'indolent' imagination finds satisfaction but no stimulus to thought under such circumstances and duly noted that 'the bulk of mankind' often express no interest in the common-place. For example, the conversion of food into flesh and bone (Astronomy, II.11), even looking-glasses, become 'so familiar' that men typically do not think that 'their effects require any explication' (Imitative Arts, I.17). In the same way, Smith cited the example of the skilled artisan (such as a brewer, dyer, or distiller) who effects the most remarkable transformations in the materials that he uses and yet 'cannot conceive what occasion there is for any connecting events to unite those appearances, which seem to him to succeed each other very naturally. It is their nature, he tells us, to

[6] This point is emphasized by Moscovici, op. cit., 5.
[7] See J. F. Becker, 'Adam Smith's Theory of Social Science', *Southern Economic Journal*, xxviii (1961–2).

follow one another in this order, and that accordingly they always do so.' (Astronomy, II.11.)

Three points are worth emphasizing before going further: first, Smith places a good deal of weight on 'conventional' knowledge[8] (i.e. that kind of 'knowledge' which is based on customary connection), and on the fact that the imagination *is* 'indolent'. As Smith put it, men 'have seldom had the curiosity to inquire by what process of intermediate events' a given change is brought about, where 'the passage of the thought from . . . one object to the other is by custom become quite smooth and easy' (Astronomy, II.11). In fact Smith had very little more to say about the origin and nature of 'knowledge' of *this* kind.

Secondly, Smith stressed the difference between the philosopher and the ordinary man, while being careful to add that these differences arise 'not so much from nature, as from habit, custom, and education' (WN I.ii.4). But habit, custom, and education can make the philosopher more perceptive, so that just as the botanist differs from the casual gardener, or the musician from the generality of his auditors, so he 'who has spent his whole 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' (Astronomy, II.11).

Finally, it must be emphasized that in the Astronomy Smith was not so much concerned with the state of 'composure' *per se*, as with the sources of its disturbance, and the nature of those processes by virtue of which that state could be re-established. In fact, Smith was largely concerned with a very specific aspect of the problem of 'knowledge', namely, the stimulus given to the undertanding by 'sentiments' such as *surprise*, *wonder*, or *admiration*. The limited objective of the Astronomy was clearly stated at the outset: 'It is the design of this Essay to consider particularly the nature and causes of each of these sentiments, whose influence is of far wider extent than we should be apt upon a careless view to imagine.' (Introduction, 7.)

Smith's initial argument then is to the effect that when certain objects or events follow in a particular order, 'they come to be so connected together in the fancy, that the idea of the one seems, of its own accord, to call up and introduce that of the other'. But, while the imaginatior finds no stimulus to thought under such conditions, Smith went on to argue that this would not be the case where the 'appearances' studied were in any way *unexpected*: 'We are at first

[8] J. R. Lindgren considers that this point has often been given less than its due weight: *The Social Philosophy of Adam Smith* (1973), 6, and see generally chapter 1 together with the same author's 'Adam Smith's Theory of Inquiry', *Journal of Political Economy*, lxxvii (1969).

surprised by the unexpectedness of the new appearance, and when that momentary emotion is over, we still wonder how it came to occur in that place.' (II.8.) In other words, we feel *surprise* when some object (or number of objects) is drawn to our attention which does not fall into a recognized pattern; a sentiment which is quickly followed by that of *wonder*, where the latter is defined in these terms: 'The stop which is thereby given to the career of the 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.' (II.9.) Wonder, in short, involves a source of pain (a disutility); a feeling of discomfort which gives rise to uncertainty and 'anxious curiosity' and even to 'giddiness and confusion'. On the other hand, the *response* to this situation involves the pursuit of some explanation, with a view to relieving the mind from a state of disequilibrium (i.e. lack of 'composure'); a natural reaction, given Smith's assumptions, designed to eliminate the sense of wonder by providing some appropriate ordering of the phenomena in question, or some plausible account of the links between different objects. Finally, Smith suggested that once we have succeeded in providing an acceptable and coherent account of a particular problem, the very existence of that explanation may 'heighten' our appreciation of the 'appearances' in question. In this way, for example, we learn to *admire* a complex social structure once its 'hidden springs' have been exposed, while in the same way a theory of astronomy may help us to admire the heavens through presenting the 'theatre of nature' as a coherent 'and therefore a more magnificent spectacle' (II.12).

Surprise, wonder, and admiration are, therefore, the three *sequential* sentiments on which Smith's account of mental stimulus depends.[9]

Once again, there are a number of points which deserve notice: First, it will be observed, that man is impelled to seek an explanation for observed 'appearances' as a result of a *subjective* feeling of discomfort, and that the resulting explanation or theory is therefore designed to meet some psychological need. Nature as a whole, Smith suggests, 'seems to abound with events which appear solitary and incoherent' and which therefore 'disturb the easy movement of the imagination' (II.12). Under these circumstances, the philosopher feels the disutility involved in the sentiment of wonder; a sentiment which thus emerges as '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'

[9] Vernard Foley has emphasized the importance of classical sources, especially that of Aristotle, in this connection. *The Social Physics of Adam Smith* (1976), chap. 2.

(III.3). It follows from this that the explanation offered can only satisfy the mind if it is coherent, capable of accounting for observed appearances, and stated in terms of principles which are at least plausible.[10]

Secondly, it will be noted that wonder is the *first*, but not the only principle featured and Smith duly went on to emphasize that philosophical effort involved not only an escape from the contemplation of 'jarring and discordant appearances' but also a source of pleasure in its own right; a point made by him in suggesting that men: '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' (III.3). In fact Smith provided many examples of the kinds of pleasure which might be involved in philosophical work. In the LRBL, for example, he noted that 'It gives us a pleasure to see the phaenomena which we reckoned the most unaccountable, all deduced from some principle (commonly a well known one) and all united in one chain' (ii.133–4, ed. Lothian, 140). Likewise, in WN he referred to the beauty of a 'systematical arrangement of different observations connected by a few common principles' (V.i.f.25), and in the Imitative Arts (II.30), likened the pleasure to be derived from the contemplation of a great system of thought to the intellectual and even sensual delights of a 'well composed concerto of instrumental music'.[11]

But, perhaps characteristically, Smith noted that such sources of pleasure were not equally accessible even to those of philosophical pretensions; that scientific thought also involved a *discipline* of which not all were capable and that this discipline could sometimes put too great a strain (i.e. a disutility) on the mind *even where presented with an organized body of thought.* Under some circumstances at least, 'too severe an application to study sometimes brings on lunacy and frenzy, in those especially who are somewhat advanced in life, but whose imaginations, from being too late in applying, have not got those habits which dispose them to follow easily the reasonings in the abstract sciences' (Astronomy, II.10).

III

Most of these points find further illustration in the History of Astronomy itself, where Smith reviewed four main systems of thought, not with a view to judging their 'absurdity or probability,

[10] For comment, see T. D. Campbell, *Adam Smith's Science of Morals* (1971), chap. 1.

[11] The importance of aesthetic considerations is particularly noted by H. F. Thomson, 'Adam Smith's Philosophy of Science', *Quarterly Journal of Economics*, lxxix (1965).

their agreement or inconsistency with truth and reality', but rather with a view to considering how far each of them was fitted to 'sooth(e) the imagination'—'that particular point of view which belongs to our subject' (II.12). Looked at in this way, the analysis has a 'static' aspect at least in so far as it is designed to show the extent to which each of the four main astronomical systems reviewed does in fact 'soothe' the imagination, isolating by this means the characteristics which they have in common. But Smith goes further than his stated object in noting that the systems of astronomy reviewed followed each other in a certain historical sequence, and in exposing the causal links which, he felt, might explain that sequence. The essence of Smith's argument would seem to be that each system at the time of its original appearance did satisfy the needs of the imagination, but that each was subject to a process of modification as new problems came to light; a process of modification which resulted in a degree of complexity which ultimately became unacceptable to the imagination. This in turn paves the way for a new kind of response—the production not just of *an* account, but of an *alternative* account (in this case of the heavens); a new thought-system designed to explain the *same* problems as the first, at least in its most complex form.

From one point of view this is the classic pattern of cultural history—human activity released within a given environment ultimately causing a qualitative change in that environment—as illustrated, say, by the development of language or the transition from feudalism to the commercial stage (WN III). But there is a difference, partly because 'environment' here relates to a state of 'knowledge' and partly because the reactions of individuals are now described as *self-conscious*—i.e. designed deliberately to modify an existing thought-system or to replace it with a more acceptable alternative.

As a means of illustrating the burden of the argument, it may be helpful to review the origin, development, and decline of the first astronomical system before going on to say something of those which followed it. Specialist comment on the astronomical *content* (e.g. as to its accuracy) of Smith's treatment is outwith the competence of the general editors, and must be left to the historian of science.

On Smith's argument, the first astronomers were faced with the need to explain the movements of the Stars, Sun, Moon, and five known planets; a task which was fulfilled in terms of a theory of Solid Spheres each of which was thought to have a circular but regular motion.[12] The Stars for example, being fixed in their positions

[12] Much later in the argument Smith provided an interesting explanation for such choices.

(*continued*)

relative to one another, while changing with reference to the observer, 'were naturally thought to have all the marks of being fixed, like so many gems, in the concave side of the firmament, and of being carried round by the diurnal revolutions of that solid body' (IV.1). Additional Spheres were used to account for the movements of the Sun and Moon (one inside the other to explain the eclipse) with five more for the planets or 'wandering stars'. The astronomical system which emerged thus represented the Earth as: 'self balanced and suspended in the centre of the universe, surrounded by the elements of Air and Ether, and covered by eight polished and cristalline Spheres, each of which was distinguished by one or more beautiful and luminous bodies, and all of which revolved round their common centre, by varied, but by equable and proportionable motions' (IV.5).

Such a system of thought apparently met the needs of the imagination by providing a coherent and plausible explanation for observed phenomena, and, in connecting by simple and familiar processes the 'grandest and most seemingly disjointed appearances in the heavens', added to man's admiration for them (IV.4).

Indeed, even if some contemporaries recognized that such a system did *not* account for *all* appearances, the degree of completeness was such that the generality of men would be tempted to 'slur over' (IV.6) such problems rather than qualify in any degree the satisfaction derived from the theory itself. In fact, Smith went on to suggest that this beautiful and appealing construction *of the intellect* might 'have stood the examination of all ages, and have gone down triumphant to the remotest posterity' had there been 'no other bodies discoverable in the heavens' (IV.4).

But additional bodies *were* discovered, and this together with the fact that Eudoxus was not one of the 'generality of men' led to the need to modify the existing system and to the addition of more spheres, as a means of accounting for changes in the relative positions of the planets. As a result Eudoxus raised the total number of spheres to 27, Callippus to 34, and Aristotle 'upon a yet more attentive observation' to 56 (until Fracastoro, 'smit with the eloquence of Plato and Aristotle and with the regularity and harmony of their system', felt it necessary to raise the number of spheres to 72, IV.7). In this way the relatively simple system of Eudoxus was gradually modified in order to meet the needs of the imagination when faced with new problems to be explained, until a situation was reached where the

The circle was used, he suggests, because it 'is of all curve lines the simplest and the most easily conceived' (IV.51) while 'an equal motion can be more easily attended to, than one that is continually either accelerated or retarded' (IV.52).

explanation offered actually violated the basic prerequisite of simplicity (IV.8).

In consequence, Smith suggests, a second major system was developed—by Apollonius (subsequently refined by Hipparchus and Ptolemy)—that of Eccentric Spheres and Epicycles. Once again, therefore, we are presented with a system which was designed to 'introduce harmony and order into the mind's conception of the movements' of the heavenly bodies and which succeeded in so doing at least at one stage of its development. However, the same argument is advanced by Smith; namely, that a gradual process of modification followed as adherents of the new system came to terms with new observations, or newly perceived problems, until a situation was once more reached where this intellectual system or 'imaginary machine': 'though, perhaps, more simple, and certainly better adapted, to the phaenomena than the Fifty-six Planetary Spheres of Aristotle, was still too intricate and complex for the imagination to rest in it with complete tranquillity and satisfaction' (IV.19). Indeed, Smith considered that the situation became even more complex and thus unsatisfactory as a result of the efforts of the Schoolmen, and especially those of Peurbach, who laboured with perverse ingenuity to reconcile the first astronomical system (of Concentric Spheres) with the second which had been designed to replace it (IV.25).

The response to *this* situation was the system of Copernicus: a system prompted, 'he tells us', by the confusion 'in which the old hypothesis represented the motions of the heavenly bodies' (IV.28).

Like the system which it was to replace, the Copernican managed to account for observed appearances in the manner of a simpler 'machine', requiring 'fewer movements' and by representing: 'the Sun, the great enlightener of the universe, whose body was alone larger than all the Planets taken together, as established immoveable in the center, shedding light and heat on all the worlds that circulated around him in one uniform direction, but in longer or shorter periods, according to their different distances' (IV.32). This was to prove an attractive hypothesis to some, not merely because of the beauty and coherence of the system, but also because of the novelty of the view of nature which it suggested—emphatically the case with an account which 'moved the Earth from its foundations, stopt the revolution of the Firmament, made the Sun stand still' (IV.33).

Yet at the same time, Smith argued that the system was by no means acceptable to all or even to those who confined their attention to astronomical matters, the difficulty being that Copernicus had invested the earth with a velocity which was 'unfamiliar', i.e. which ran counter to normal experience. The imagination tended to think

of the earth as ponderous 'and even averse to motion' (IV.38), and it was this difficulty which led to the formulation of the alternative system of Tycho Brahe—a system partly prompted by jealousy of Copernicus, but none the less a system to some extent compounded of those of the latter and of Ptolemy. In this system, 'the Earth continued to be, as in the old account, the immoveable center of the universe' (IV.42). Smith added that Brahe's account was 'more complex and more incoherent than that of Copernicus. Such, however, was the difficulty that mankind felt in conceiving the motion of the Earth, that it long balanced the reputation of that otherwise more beautiful system' (IV.43).

In other words, the coherence and simplicity of the Copernican system was qualified by the unfamiliarity of one of its central principles; a problem which was so important as to render a more complex account more acceptable to some than it could otherwise have been. Interestingly enough, Smith represents subsequent developments as involving an attempt to make the more elegant system (of Copernicus) acceptable to the imagination by removing the basic difficulty—i.e. by providing a plausible explanation for the movement of the Earth. In this connection Smith argued that the astronomical work done by Kepler contributed to the completion of the system, while research on the problem of motion by Galileo helped to remove some of the more telling objections to the idea of a moving Earth. But in terms of the general acceptance of the idea of the Earth spinning at high velocity Smith gave most emphasis to the work of Descartes, who had represented the planets as floating in an immense ocean of ether containing 'at all times, an infinite number of greater and smaller vortices, or circular streams' (IV.62). Once the imagination accepted a hypothesis based on the familiar principle of motion after impulse, it was a short step to the elimination of the central difficulty since 'it was quite agreeable to its usual habits to conceive' that the planets 'should follow the stream of this ocean, how rapid soever' (IV.65). He added, in a significant passage, that under such circumstances: 'the imaginations of mankind could no longer refuse themselves the pleasure of going along with so harmonious an account of things. The system of Tycho Brahe was every day less and less talked of, till at last it was forgotten altogether' (Ibid.).

Yet, as Smith went on to note, the modifications introduced by Descartes were not prompted by *astronomical* knowledge so much as by a desire to produce a plausible explanation for the Copernican thesis. Moreover, he noted that further observations, especially those of Cassini, supported the authority of laws first discovered by Kepler for which the Cartesian 'theory' could provide no explanation. Under

such circumstances, the latter system while it 'might continue to amuse the learned in other sciences . . . could no longer satisfy those that were skilled in Astronomy' (IV.67).

The Cartesian system was to give way to the Newtonian; a theory which was capable of accounting for observed phenomena in terms of a small number of basic and familiar principles, and of successfully predicting their future movements. Smith wrote of the Newtonian system with real enthusiasm and in his Letter to the *Edinburgh Review* rejoiced as a 'Briton' to find the contributors to the *Encyclopédie* acknowledge its authority as compared to that of Descartes. Characteristically, however, he left readers of the Astronomy with the reminder that 'all philosophical systems' are 'mere inventions of the imagination', even though he had 'insensibly been drawn in' to write as if Newton's system was objectively true (IV.76; cf. Section V below).

IV

While the papers in this volume help to illustrate Smith's wide range of interests, they also confirm that he had an extensive knowledge of literature of a broadly scientific kind. The Astronomy, for example, suggests a very close knowledge of the works of classical authors, together with more modern writers such as Cassini, Kepler, Descartes, Copernicus, and Newton. Other essays extend the list to include Franklin and Linnaeus, while the Letter to the *Edinburgh Review* calls attention to Boyle and Bacon, together with Continental authors such as d'Alembert, Buffon, Daubenton, and Réaumur.[13] It is worth observing in this connection that Dugald Stewart called attention to Smith's unusual knowledge of Continental scientific work (I.25) and considered the 'mathematical sciences' to be 'very favourable subjects for theoretical history'—a fact which may have prompted Smith to undertake 'perfectly analogous' inquiries into the wider fields of language and jurisprudence (II.49,50).[14]

There can be no doubt that Smith regarded such exercises in theoretical history as having a serious scientific purpose or that an essay such as the Astronomy conforms in terms of structure to the general requirements of didactical discourse as set out in LRBL. At the same time, the argument of the Astronomy appears to rely on the use of both reason and experience—partly by virtue of passing in

[13] It is conceivable that Smith's knowledge of contemporary work in biology may have influenced his historical outlook. See Skinner, op. cit., 181–2.

[14] A major direct influence was probably Rousseau, whose work features in the Letter to the *Edinburgh Review*.

review a series of models which had a historical existence, and partly by explaining their appearance, development, and replacement by reference to a number of principles of human nature whose manifestations could be empirically verified. In this sense, Smith's methodology would seem to conform to the requirements of the Newtonian method properly so called in that he used the techniques of analysis and synthesis in the appropriate order. For, as Colin Maclaurin pointed out: 'in any other way, we can never be sure that we assume the principles that really obtain in nature; and that our system, after we have composed it with great labour, is not mere dream and illusion'.[15]

'Dream and illusion' . . . yet it is one thing to suggest that the ('first order') activities of individuals in the field of philosophy or science can be *studied* in a 'scientific way' (the 'second order' enterprise on which Smith was engaged) and another to argue that activity of either kind can always be said to be *scientific* in the sense of conforming to the ideal of objectivity. Moreover, Smith's discussion of the principles which lead and direct philosophical inquiries concentrates, as we have seen, on the needs of the imagination—on broadly psychological needs—so that, as Richard Olson has recently pointed out:

> The great significance of Smith's doctrine is that since it measures the value of philosophical systems solely in relation to their satisfaction of the human craving for order, it sets up a human rather than an absolute or natural standard for science, and it leaves all science essentially hypothetical. Furthermore, Smith implied that unceasing change rather than permanence must be the characteristic of philosophy.[16]

While this position does seem accurately to express the burden of Smith's argument as contained in the Astronomy, two points might be suggested by way of qualification. First, it should be noted that Smith did not claim an *exclusive* role for the central principles of surprise, wonder, and admiration, but rather asserted that the part played by these sentiments was 'of far wider extent than we should be apt upon a careless view to imagine'. Secondly, it is worth remarking that while Smith regarded all theoretical constructions as products of the imagination designed to meet its needs, he also indicated that there was a difference between the natural and moral sciences. As he put the point in the TMS (VII.ii.4.14):

> A system of natural philosophy may appear very plausible, and be for a long

[15] *An Account of Sir Isaac Newton's Philosophical Discoveries* (1748, ed. 3, 1775), 9.

[16] *Scottish Philosophy and British Physics, 1750–1880* (1975), 123. The hypothetical element in Smith's thought is also noted by Moscovici, op. cit.