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Ronald B. Hatch

University of British Columbia

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RONALD B. HATCH

William Smellie: Philosopher of Natural History

In the eighteenth century, the name of William Smellie was doubly famous, for there were two extraordinary men with the same name: the obstetrician who developed a workable set of forceps and the natural historian. In medical circles, the obstetrician is still well-known, but one finds little mention today of William Smellie (1740–1795), the secretary of the Society of Antiquaries and Fellow of the Royal Society of Edinburgh. If remembered at all, it is probably for his compilation of, and articles in, the first edition of The Encyclopaedia Britannica (1771). In his own time, however, he was also famous as an Edinburgh printer, the translator of Buffon's Histoire Naturelle and most important of all, as the author of The Philosophy of Natural History (1790–99), in two massive quarto volumes, running to over one thousand pages. This work which went into at least ten editions by the 1860s, and was translated into Danish and German, fascinated readers of the late eighteenth and early nineteenth centuries by the way it attempted to derive insights about man’s nature and his future from the study of plants and animals. Part of the reason for Smellie’s popularity undoubtedly lies in his ability to present his materials in a graphic style. As a printer, Smellie corrected the proofs of many eighteenth-century Scots writers,¹ and developed for himself a prose style that is lively and colourful, eminently worth reading. In The Philosophy of Natural History, he includes among the many records of detailed experiments a number of good stories about dogs and pyemen in old Edinburgh, cats and closet locks, newly discovered animals in Africa, and a whole host of reputed “monsters” such as the mule that became pregnant. Occasionally, his writing even takes on a personal cast

¹ Smellie's biographer, Robert Kerr, comments: “Almost the whole Scots literature of any moment in his day was printed and corrected by him.” Memoirs of the Life, Writings, & Correspondence of William Smellie, 2 vols. (Edinburgh, 1811), i, 328–29.

[159]
when he includes material from his own experiences. For instance, in developing his theory that dreams reveal much about an individual's personality that ordinarily remains repressed, he recounts one of his own dreams where, in the midst of a dance with a young lady, his "breeches fell plump to [his] heels!" It seems likely that this "popular," informal manner of presentation owes something to Smellie's well-informed, lay audience of Edinburgh intellectuals, who, as Steven Shapin has argued, were extremely important as patrons of such cultural endeavours as Smellie's.

Part of the reason, then, for the popularity of The Philosophy of Natural History is undoubtedly that Smellie set out with a similar intention to that of the poets and novelists—"to convey both pleasure and information" (1, vi). It might even be argued that Smellie's successful approach to his subject influenced the style of the many later lectures on zoology, given at such places as the London Institution, which, as J. N. Hays has pointed out, were designed to provide amusement and instruction. Yet Smellie's talent as a story-teller was not the only, or even the main, reason for the book's success, and is certainly not the chief reason why he is worthy of reconsideration today. As Smellie indicates in his title, he intended to give the "philosophy" of natural history, and it is this unique approach to the subject which gives his work interest. What Smellie meant by a "philosophy" of natural history is by no means immediately clear. In his preface he notes that he does not intend to treat the "productions of Nature" individually, but plans to arrange them "under general heads" so that in each division he could present "the known facts, as well as reasonings" (1, v–vi). A letter that Smellie wrote to the Earl of Buchan in 1781 indicates that his plan was to discuss natural history "not as a science," but as a body of observations and conceptions open to general interpretation and explanation.

2 The Philosophy of Natural History (Edinburgh, 1790–1799), II, 375. All subsequent references are to this edition and will appear in parentheses in the text. This particular dream he recorded many years earlier in a letter to a friend. See Kerr, 1, 180–81.


in other words, as philosophy. Four years after the publication of the first volume of *The Philosophy of Natural History*, James Hutton, an acquaintance of Smellie, clarified this usage of "philosophy" and "science" when he stated in the preface to *A Dissertation upon the Philosophy of Light, Heat and Fire* (1794) that the role of science is to establish "particular physical and mathematical truths," while it is the role of philosophy to generalize from these truths so that they form a part of "the general order of our knowledge." Clearly both men were anxious to point out, and to employ, the distinction between evidence of particulars and the induction of general laws—a distinction central to philosophy from the time of Hume's *Treatise* (1739). In their usage of "philosophy," Smellie and Hutton were introducing a distinction between the process of generalization and the empirical discovery of particular facts of experience.

It would have been relatively easy, given this distinction between philosophy and science, for Smellie to have written a mere overview or synthesis of the major known facts about the natural world—a prosaic if by no means simple task, given the enormous increase in knowledge during the eighteenth century. Yet as Smellie himself was aware, any good explanation of a science inevitably leads to a discussion of its first principles and presuppositions. As an example, it is useful to compare Sir Arthur Eddington's Tarner Lectures of 1938 which he entitled *The Philosophy of Physical Science*. Eddington, of course, is a good deal more rigorous than Smellie, but what both men have in mind when they discuss the philosophy of a science is to study the implications of the manner in which the science is practised. For Eddington, this meant a study of the epistemology of relativity. As will be seen shortly, Smellie's methodology of natural

5 Letter from Smellie to the Earl of Buchan, Sept. 20, 1781. Quoted in Kerr, ii, 102.

6 James Hutton, *A Dissertation upon the Philosophy of Light, Heat and Fire* (Edinburgh, 1794), vii-xii. The OED incorrectly cites Hutton as the first person to use "philosophy" in this sense. Smellie had preceded Hutton by four years.

7 A number of "popular" works, designed to give an overview of the subject of natural history, began appearing at this period and have continued to appear until the present day. One of the better known is N. A. Pluche's *Le Spectacle de la Nature* (1732) which was translated into English by different translators numerous times throughout the eighteenth century.
history, in which man was no longer seen first as a unique creation with an immortal soul, but as a species of fauna to be studied objectively, is offered as an alternative mode to metaphysical enquiry; it constitutes the scientist's response to philosophy. Man is no longer seen as a special case, but as yet another species of mammal in the animal kingdom. As will become apparent, however, at various crucial points, Smellie found himself unable to accept the implications of his methodology, and was forced to introduce unwarranted assumptions.

Apprenticed to a printer at an early age, Smellie, like many other famous Scots of his time, never studied formally towards a university degree. But his employers, Murray and Cochrane, were most liberal, and allowed him three hours a day to attend lectures at Edinburgh University. Smellie's letters at this time, published in a slightly bowdlerized form by Robert Kerr, give an excellent picture of the range of eclectic studies open to the studious Scot living in the Edinburgh of the mid-eighteenth century. By means of his independent study, Smellie became learned in a surprising number of fields. Although never a professional naturalist, Smellie was from his early years keenly interested in natural history, and was active in making his own collection of specimens. He won a gold medal from Dr. Hope for an essay he wrote opposing Linnaeus on his theory of the sexes of plants, and when Dr. Hope fell ill for a time, he asked Smellie to take over his botany lectures in Edinburgh.

The origin of Smellie's book on natural history is instructive. The idea arose out of a comment by Henry Home, Lord Kames, in his *Sketches of the History of Man* (1774). In a brief appendix to a sketch dealing with the "Progress of the Female sex," Kames had tried his hand at some natural history "Concerning Propagation of Animals, and Care of their Offspring." Kames had argued that one could deduce that marriage was natural to man from the actions of other animals. All animals pair whose young require extended care. Since man's children also require extended care, marriage is therefore

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8 In September 1759, Smellie began his apprenticeship with Murray and Cochrane of Edinburgh. See Kerr, 1, 34–36.
10 He presented his collection of dried plants to Professor Hope. See letters quoted in Kerr, 1, 93–94.
"natural" to man. Kames commented that he included this appendix partly because he was "loth to neglect a subject that eminently displays the wisdom and benevolence of Providence," but also because Buffon had said little on the subject, and because the older physico-theologians such as Derham and Ray appeared to be neglected.\(^{12}\) He concluded the section with the tantalizing remark that he had dropped only hints, that "the field is rich, tho' little cultivated."\(^{13}\) Smellie, who was already slightly acquainted with Kames, wrote almost immediately to say how much he admired the work, especially the section on natural history, and to mention that he would soon write "a short commentary, which will be sent for your Lordship's perusal."\(^{14}\) Kames appears to have encouraged Smellie to go beyond a mere commentary, since in the next known letter from Smellie to Kames, Smellie remarks:

With regard to the article on Natural History, it will be very difficult to say any thing to purpose in such short bounds. However, I shall endeavour to crow in as much matter as possible. . . . If it have the good fortune to please you, I need be under no apprehension of publishing it; if otherwise, it shall never appear.\(^{15}\)

Kames' approval must have been forthcoming, for the article appeared shortly afterwards in Smellie's *Edinburgh Magazine and Review*, and will be dealt with later.\(^{16}\)

In his Preface to *The Philosophy of Natural History*, Smellie comments that the idea for the work had been suggested to him "in a conversation" with Lord Kames "about fifteen years ago" (i, v), in other words about the time that Smellie wrote his review. This would suggest that Kames advised Smellie to expand his ideas in the review. The incident is further elaborated in Smellie's letter of 1781 to the Earl of Buchan:

In the year 1774, my learned, ingenious, and honourable friend, Lord Kames, suggested to me a plan for Discourses or Lectures, not on Natural History

\(^{12}\) Lord Kames, *Sketches of the History of Man* (Edinburgh, 1774), i, 220.

\(^{13}\) *Sketches*, i, 225.

\(^{14}\) Letter from Smellie to Kames, April 23, 1774. Quoted in Kerr, i, 354.

\(^{15}\) Letter from Smellie to Kames, n.d. Quoted in Kerr, i, 355–56.

\(^{16}\) Article III on *Sketches of the History of Man*, in *The Edinburgh Magazine and Review*, ii (1774), 430–37. Smellie was also partly responsible for another article on Kames. Gilbert Stuart, the principal contributor, apparently wrote a blistering attack on Kames' *Elements* which Smellie re-wrote and recast. See Kerr, i, 408–9.
as a science, but on the Philosophy and General Economy of Nature. This plan, which I highly relished, received such hearty approbation from the late worthy DR RAMESAY, who was the first professor of Natural History in this country, that he gave me every assistance in books and advice.¹⁷

Part of the reason for these projected discourses may have been that Professor Ramsay was ill at this period and often unable to lecture.¹⁸ Although Smellie began at once collecting materials for his natural history, he was forced to give up serious research for a while when he decided to devote all his spare time to his important translation of the Count de Buffon’s Histoire Naturelle.¹⁹ Then in 1781, when he was completing the translation, he was elected Keeper and Superintendent of the new Museum of Natural History belonging to the Society of Antiquaries of Scotland, and given the privilege of lecturing on natural history in their hall.²⁰ His notes were still incomplete at this time, but even so, the idea of a lecture series had to be dropped altogether when Dr. Walker, the newly elected Professor of Natural History at Edinburgh University, opposed the plan on the grounds that he would lose students, and therefore fees.²¹ Recasting his materials once again, Smellie decided to publish them as a book; the first volume came out in 1790, but the second volume did not appear until 1799, published posthumously by Smellie’s son, Alexander Smellie.²²

At the outset, Smellie appears to have had few, if any, reservations about the direction and implications of his work. Beginning boldly with a discussion of taxonomic principles, he launches an attack on the prevailing analytic systems of taxonomy of the time in which natural historians began with definitions and advanced by

¹⁸ Kerr’s conjecture, II, 88.
¹⁹ Translated in 9 volumes as Natural History, General and Particular (1780–85).
²⁰ The Society was instituted in 1780, with Smellie as one of the founding members.
²¹ See letter from Dr. John Walker to the Earl of Buchan, Sept. 14, 1781. Quoted in Kerr, II, 99–100. Smellie had been a candidate for this Chair, but it was given to Dr. Walker.
²² Volume II was finished and ready for the press as early as February 1795, but Smellie could not obtain the price he wanted. For volume 1 he had received the staggering sum of £1,000. See Kerr, II, 181.
a priori reasoning. Smellie realized that if he wanted to describe the
significance of the patterns that he found in nature then he could
not allow himself to be tied by artificial systems of nomenclature.
Such an approach constituted an attack on natural history as it had
been conceived by Theophrastus and remained for the most part until
the time of Charles Darwin and the Origin of Species (1859). With
the exception of a few writers, the principle of classification before
Darwin was generally that of logical division where the questions
asked were: What is the essential nature of this species? What is
the difference between species A and species B? 23 The answer to
such questions is a definition: the essential nature of a horse is——;
the essential nature of quadrupeds is ———. Because Smellie's
interest was primarily synthetic rather than analytic such a procedure
was of little help to him. Moreover, he was conscious that the most
important a priori system of the time was that of Linnaeus, and
Linnaeus's sexual system of classification was not only a priori, but
patently artificial since it did not classify plants by their "essence,"
but by the number of pistils and stamens in their flowers. Linnaeus'
reason for this was of course obvious: the large number of new
plants being discovered at this period required a system that could
cope with, and as it were, serve as a filing cabinet for the influx.
Without some such system, chaos would have resulted. 24 Since the
main concern of naturalists in the eighteenth century was classification,
with Linnaeus the towering figure, Smellie's defiant attitude
may seem quite revolutionary, but in the examples he cites it is
apparent that he is drawing for his ideas on the work of Buffon,
Tremblay, and Spallanzani who in their experimentation with inver-
tebrates had pointed out the contradictions between physiological
phenomena and the classification procedures. 25 Equally important
for Smellie as a basis for his attack on the conventional plan of
nature as revealed in classification systems was his recognition that
none of the criteria proposed—such as sensitivity, irritability or loco-

23 For a discussion of early taxonomic principles, see P. H. Davis and
V. H. Heywood, Principles of Angiosperm Taxonomy (Edinburgh, 1963),
pp. 1–50; and A. T. Hopwood, "The Development of Pre-Linnaean Tax-
24 Davis and Heywood, Principles, p. 17.
25 See Joseph Schiller for an account of this controversy, in "Queries,
Answers and Unsolved Problems in Eighteenth Century Biology," History
of Science, xii (September 1974), 184–99.
motion—was adequate as a test for differentiation. Smellie mentions numerous examples of the type such as the "sensitive plant" (soon to be made famous by the poet Shelley), "the moving plant" which he had observed in the botanic gardens of Edinburgh, and Réaumur's polyp, all of which he felt undermined rigid classification.

Even as early as 1774, in his review of Kames' Sketches, Smellie was arguing that, although artificial classifications were useful, naturalists must attempt to develop a "natural" system of classification that accounted for all the differing characteristics, and therefore reflected the order of the natural world. In his first chapter of The Philosophy of Natural History where he discusses the two kingdoms—plants and animals—he is highly critical of such scientists as Jungius, Ludwig, and Linnaeus who begin by describing or defining the essential characteristic of plants and animals, and who then proceed to apply the definition to all living organisms (1, 1–3). It was all very well, Smellie observed, to establish criteria for animals and plants, and then to place the various species in one or the other kingdom, but did not such classification imply that clear logical distinctions existed in nature as well as in the terminology? Smellie claimed that all the recent evidence pointed in the other direction.

Believing it to be impossible "to ascertain the precise boundaries between the animal and vegetable" (1, 3), Smellie begins by portraying the qualities that animals and plants have in common. He believes that "the transition from the animal to the plant is effected by shades so imperceptible, as to elude the most acute observers" (1, 12). On the connection between plants and minerals the evidence was not nearly so complete; Smellie concludes that "there is a vast chasm in the chain of being" (1, 12). At this time when chemistry was in its infancy Smellie might easily have decided on the available data that plant life is completely divorced from inert matter, but his synthetic method, which led him to look for analogies in every sphere of the universe, suggested rather that the "vast chasm" between inert matter and plants might one day "be the source of great discoveries" (1, 12), as of course is happening at the moment. In these comments, Smellie is not contradicting what he said in his review of Kames on the need for a natural system of nomenclature that reflects the actual

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26 The Edinburgh Magazine and Review, 11 (1774), 432–33. Most taxonomists today believe that a "natural" system must be based on phylogeny, the species' evolutionary development.
order of nature. But clearly he is suggesting that the order of nature may be so complex as to make impossible precise distinctions in terms of mutually exclusive sets of characteristics.

All his confident assertions notwithstanding, Smellie soon became concerned about this attitude to taxonomy, with its radical assumption that the natural world may not be divided into logically distinct compartments, easily described in language. At the beginning of his second volume, and quite out of place, Smellie inserted a long chapter entitled “Of Method.” He begins as if about to continue his earlier train of thought: “In such a multifarious subject as natural history . . . it was necessary to invent some mode of generalising our ideas” (my italics, II, 2). But he then proceeds to attempt to refute Buffon, and to claim “that methodical distribution is not only useful in the study of Natural History, but that Nature has actually presented her productions to us, not in an immensity of unconnected individuals, but in larger or smaller groups, linked together by unambiguous relations” (my italics, II, 5). 27 Smellie is quite clear about what is at stake. He is defending “a general subordination and concatenation” (II, 6) in nature as opposed to Buffon who held: “We ought not, however, to forget, that these families, or genera, are created by ourselves, in order to assist the understanding . . . [Nature] has made only individuals.” 26 Smellie now asserts that Nature herself makes the connections. Although Smellie claimed to be certain about the division of nature into distinct classes and genera, he recognized that a problem existed with the intermediate stage between classes and genera (in other words, the Order of the genera), but he attributed the failure of naturalists to agree on a “natural” system in Orders to a lack of evidence:

We are already acquainted with many instances, in the animal kingdom, of particular relations by which several genera of the same class are


28 This is Smellie’s translation of Buffon as it appears in The Philosophy of Natural History, II, 62–63. For the original text, see Histoire Naturelle, IV, 384. Smellie, it should be remarked, is said to have used a curious method of translation. He would closely study six or eight pages, and then render the whole into English. See Kerr, II, 118.
peculiarly connected. A thorough knowledge of these natural relations is all that is necessary for the construction of a perfect method. But there is such a variety of circumstances to be learned, of which we are as yet perfectly ignorant, that the industry and experience of many ages will still be necessary, if indeed we can ever hope, for the acquisition of this great desideratum in natural history. (ii, 6–7)

It is, of course, impossible to be certain why Smellie has become so adamant at this point about the absolute fixity of species, genera and orders when earlier he had been equally adamant that the evidence indicated that no absolute disjunction existed between the plant and animal kingdoms, but it would appear that he had become uneasy about the implications of such arguments. If it were true that man created his system of taxonomy rather than discovered it, then the “philosopher” of natural history was revealing only his own cleverness, and nothing about the design of the universe and its wisdom.

That such a problem should arise for Smellie is predictable, given his basic assumptions about the division between “philosophy” and “science,” for this division involves the subjectivism inherent in all eighteenth-century British empirical philosophy, but made explicit by Hume. Hume, it will be recalled, had concluded, reluctantly, that man could be absolutely certain only of the primary impressions or sense data; all conclusions or generalizations about the ordering principles of the world based on these primary impressions were nothing more than the customary associations made by the mind as a result of instinct.29 In other words, Hume was attributing the order to be found in the world to man’s mind. The entire problem, of course, had its roots in the Cartesian separation of mind and matter.

What appears to have happened is that late in the writing of the Philosophy, Smellie, who was a theist by temperament, and who earlier had contemplated writing a “Physico-Theological Essay on Botany,”30 became disturbed by his methodological assumptions and altered them. This is not to say that Smellie was attempting to prove God’s wisdom from his demonstrations of design as was the case with Ray, Derham, Paley, and the later “Bridgewater” authors; rather, he accepted that man’s power of analogical generalization

30 See Kerr, i, 158.
WILLIAM SMELLIE

is the mirror image of design in the universe, with design implying providence.

Another area in which Smellie appears to have had some difficulty in reconciling his theism with his empirical observations was in comparative anatomy, where his synthetic method of tracing analogies in all living organisms was leading him dangerously close to radical evolutionary ideas that could discredit the Mosaic account of creation, and this he did not want. If it could be shown that the various species and genera were not distinct entities, then the idea of a special creation in which each plant and animal was given its “essence” was called in doubt. As soon as one found species that not only filled gaps in the scale of creation, but created “overlaps,” then it became necessary to devise a theory to account for the formation of such “overlaps.” The accumulation of such findings on the transmutation of species was one of the factors that led Charles Darwin to formulate his evolutionary theory.

Although Smellie was most unwilling to give up the special creation theory and develop an evolutionary one, The Philosophy of Natural History contains much—especially early in the first volume—that would seem to be leading him towards evolutionary concepts. His constant search for similarities and analogies, rather than differences, in species and genera leads him to discuss the essential unity underlying all creation, and might easily have forced him to abandon his static stance and to assume a dynamic one in which particular species develop in terms of others. The most striking example of this tendency occurs when he draws on his knowledge of Buffon to show that man’s shape is remarkably similar to those of other quadrupeds:

Raise the skeletons of quadrupeds, from the ape-kind to the mouse, upon their hind-legs, and compare them with the skeleton of a man, the mind will be instantly struck with the uniformity of structure and design observed in the formation of the whole group. This uniformity is so constant, and the

31 For a recent account of the many different ways in which eighteenth-century ideas on evolution meshed with theism, see Peter J. Bowler, “Evolutionism in the Enlightenment,” History of Science, XII (1974), 159–83.

gradations from one species to another are so imperceptible, that to discover the marks of their discrimination requires the most minute attention. (1, 55)

Such comparative anatomy obviously contained a whole host of possibilities, but as was the case with John Hunter—the most famous comparative anatomist of the eighteenth century—Smellie seemed determined to avoid evolutionary concepts that might upset Mosaic chronology. Four years later, Erasmus Darwin in his *Zoönomia* caused considerable reaction from the Church when he deduced his evolutionary theory from the findings of comparative anatomy and the breeding of animals. Smellie generally skirts the issue, maintaining the theory of plenitude made famous by Leibnitz, that underlying all creation there is a single plan, with each species being a variant form (1, 55). Yet with his many examples of the remarkable similarity of species, it would have been odd had Smellie not attempted some modified form of evolutionary development. And so he does. Unlike Pierre Maupertuis (and Smellie may have read him) who developed the theory that evolution takes place by means of hereditary variants that are sudden and accidental, Smellie leaned towards what is now called the Lamarckian concept of acquired characteristics, and developed a theory of environmental influence (phenotypic as opposed to genotypic) that stops just short of a truly evolutionary concept. He notes that “climate and food are the chief causes which produce changes in the magnitude, figure, colour, and constitution, of wild animals” (1, 460). And he adds that “when obliged by man, or by any great revolution of Nature, to abandon their native soil, they undergo changes so great, that, to recognise and distinguish them, recourse must be had to the most accurate examination” (1, 460). Moreover, he is astute enough to recognize that when dealing with “nature,” he cannot make use of such human concepts as progress: “With regard to Nature, improvement and

36 See Kerr, 1, 169.
WILLIAM SMELLIE

degeneration amount to the same thing; for both imply an alteration of the original constitution” (1, 461). His notion of acquired characteristics in its most extreme (and most inaccurate) form can be seen in the comment that “Dogs who have had their ears and tails cut for a few generations, transmit these defects, in a certain degree, to their descendants” (1, 462). Yet Smellie's theory of change cannot actually be termed "evolutionary" since he refuses to countenance the possibility that species might change out of all recognition as a result of natural selection acting on variants. Instead, he maintains that "on every animal Nature has imprinted a certain character, which is indelibly fixed, and distinguishes the species"; this character can be modified by external circumstances, but "never fully obliterated" (1, 464). It is worth remarking at this point that so long as writers such as Smellie thought of the age of the earth in terms of six thousand years, the notion of evolution of species appeared improbable. One of the reasons why Erasmus Darwin felt confident about evolution was his belief that the world had probably existed for "millions of years" rather than the mere six thousand years of biblical commentary. Given his assumptions about the age of the earth, Smellie’s belief that species could be modified but not transformed was not unreasonable, since the time available for evolution was insufficient.

That Smellie never even discusses the important question of the age of the earth is surprising, since he must have been aware of changing views on the subject. In 1788, two years before the publication of Smellie’s *The Philosophy of Natural History*, Hutton had published his “Theory of the Earth” in the *Transactions of the Royal Society of Edinburgh*. There he had concluded: “We find no vestige of a beginning,—no prospect of an end.”38 Since Smellie had translated Buffon, he was also fully acquainted with Buffon’s many comments about the age of the earth. For instance, Buffon reviews the early accounts of fossils by Burnet, Whiston, Woodward, Bouguet, Scheutzer, Steno, Ray, Leibnitz, and then comments: “The notion that the shells were transported and left upon the land by the deluge, is the general opinion, or rather superstition, of natural-

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ists." 39 But the Faculty of Theology at the Sorbonne did not approve of such statements, and Buffon later published a retraction saying that he believed in the biblical chronology. Smellie, who had witnessed Edinburgh's unkind welcome to Hutton's theories, had already received a hint as to the scrutiny to which his own views would be subject, when Hugh Blair—reacting to Smellie's preliminary address to the public announcing his forthcoming translation of Buffon—cautioned him not to lay too much "stress upon the knowledge of mind that may be derived from the brute creation." 40 Sir David Dalrymple, Lord Hailes, had also written to tell Smellie that he did not approve of a translation of Buffon that did not include notes to confute "the atheistical parts of it." 41 As a result, when he came to publish his The Philosophy of Natural History, Smellie included in his Preface the avowal that he had shunned "every sentiment or expression which might have a tendency to injure society, or to hurt the feelings of individuals" (1, vii).

Whether or not Smellie was moving towards evolutionary ideas and decided to be cautious cannot now be ascertained. But in a prospectus or table of contents for "A General System of Natural History" (the book was never written), he shows that he had decided to give an account of both Buffon's and Hutton's theories of the formation of strata, and to explain his own new theory: "Of the different theories which have been formed upon the preceding and other historical facts:—Theory of Woodward, of Burnet, of Whiston, of Schueter, of Buffon, of Hutton, etc. A New Theory of the Earth.—General remarks by way of conclusion." 42 What this new theory is, and whether it develops from Buffon's and Hutton's ideas on the slow formation of strata, Smellie nowhere says.

Although Smellie never explored the idea that man developed from earlier forms, his conviction that all living organisms differed only in degree had important consequences for many of his other ideas. For instance, he is by no means willing to admit that a vast distance separates man from animals; he even asserts that all animals, and plants as well, have similar sensations to those of man.

40 Letter from Hugh Blair to Smellie, June 16, 1780. Quoted in Kerr, ii, 148.
41 Letter from Lord Hailes to Smellie, July 11, 1779. Quoted in Kerr, ii, 160.
42 Quoted from Kerr, ii, 111.
WILLIAM SMELLIE

(1, 11). As a result, he is eager to study animal behaviour so that the explanations discovered can be applied analogically to man. It might be thought that this approach had already been explored, since in 1765 Dr. John Gregory, of Aberdeen and Edinburgh, had published *A Comparative View of the State and Faculties of Man with those of the Animal World*. Yet as Smellie himself commented in his brief *Life* of Gregory, there is “little connection between the title and the work itself.” 43 A good example of Smellie’s comparative technique, and one that displays the care he took to be accurate, can be found in Chapter vi, of Volume ii, entitled “Of those Animals who, sleep, or continue in a torpid state, during Winter.” The chapter begins with a brief account of hibernation (Smellie does not use the word), and how it is actually a type of sleep. He then gives a large number of examples, derived from White, Buffon, Barrington, and his own experience, of animals and reptiles that have been observed while hibernating. He discusses the causes of hibernation (cold weather); whether animals can be induced to wake and to eat; what happens to the animal’s respiration rate, and so on. From these observations he then proceeds to theorize about possible changes in the manner of the circulation of the blood, but about these posited changes he could know nothing, since he did not attempt experiments. 44 By analogy, he then suggests that if men were to cover themselves up as the hedgehog does “it is probable they might be induced to sleep a very great length of time, and again awake without suffering much injury” (ii, 412). That Smellie can make such analogic jumps is the result of his deep-seated belief that the differences between the various species are not nearly so great as outward appearances at first suggest.

Although Smellie still believed in final causes, and thus attempted to give a teleological explanation for the various species, he differed from most earlier teleological moralists and theologians in

44 This is the major difference between experimental anatomists such as the Hunter brothers and a theoretical anatomist such as Smellie. Yet Smellie took great pains to be as accurate as possible. For instance, while writing this chapter, Smellie recalled that, as a student at Edinburgh University, he had heard Munro lecture on the subject. Rather than trust to his memory, Smellie wrote to the Professor and asked for the complete record of his experiments. An accurate précis duly appears in the chapter with full acknowledgement. See *Kerr*, ii, 317-20.
that he derived his sense of "the purpose" of both man and animals from their physical form. Indeed, Smellie elaborates, rather neatly, the idea that all animals can be described in terms of form and function, so that "a slight variation in structure, especially of the internal organs, is often accompanied with great diversities in dispositions, food, and manners" (1, 56). This would seem of course to make an animal's nature or character a function of its internal and external structure. Smellie agrees: "It is obvious, therefore, that the diversity of tastes and dispositions" arises not from a particular bias of their minds, "but from a physical cause depending on the structure of their bodies" (1, 60). Yet this notion is not sufficient to explain man, or even the higher animals, for if the influence of the body were the only factor, man would fall half-way between the herbivorous and carnivorous animals.

At this point in the problem, Smellie contends, most natural historians and philosophers were forced to give man a special "human faculty"—rationality—or as Swift reminds us, a capacity for reason. But Smellie, having abandoned the notion that a single characteristic could define a species, will not admit that any species could have a characteristic that is not shared by some other species. He concludes, therefore, that the problem results from the refusal of naturalists and philosophers to allow animals any vestige of rationality. His main concern, then, is to break down the duality in which animals are said to act from instinct, and human beings from reason. The most obvious solution might seem to be to claim that the higher animals have some degree of rationality. A few years later, Thomas Love Peacock was to make superb fun of this solution in his portrayal of Sir Oran Haut-Ton in Melincourt (1817). Smellie agreed that the higher animals possess human traits, and indeed, he gives a splendid account of the orang-outang, but the introduction of a new faculty, such as rationality, savoured too much of obscurantism. Furthermore, to adopt such a procedure would be to desert physiological explanations. To Smellie, a far better mode of approach was to eliminate all differences between the two types of motivation—rational and instinctual—in man and animals, and to show that one is simply a form of the other. He says: "The great source of error on this subject is the uniform attempt to distinguish instinctive from rational motives. I shall, however, endeavour to show that no such distinction
exists, and that the reasoning faculty itself is a necessary result of instinct" (1, 145).

Smellie's discussion of instincts obviously owes much to previous eighteenth-century Scottish philosophers such as Hutcheson, Hume, Adam Smith and Kames, who relied heavily on "sentiments" or instincts as an explanation of man's behaviour. Hume's "original instinct of benevolence" is perhaps the best known, but Hutcheson, for instance, introduces a number of "senses" into his account of man, with "sense" linked very closely to instinct, as his definition shows—"Every Determination of our Minds to receive Ideas independently on our Will, and to have Perceptions of Pleasure and Pain." From the time of Shaftesbury there had been a continuous line of development of the theory that man was moved by instincts basic to his nature. The word "instinct," itself, was often avoided and some such phrase as natural powers, sentiments, senses, passions was chosen. The major question (pace the Shaftesbury-Mandeville dispute) was whether the impulses could or could not be identified with God's will.

Where Smellie differs from the Scottish School in his treatment of instincts is that he is not interested primarily in discussing man as a moral being, but in seeing him as yet another animal. Descartes, of course, had insisted that all animals are machines, because they lack a soul. Smellie's intention was to break down this duality, and thus he begins with the observation that all animals, including man, are endowed with different numbers of instincts along with the ability to alter these instincts. He argues: "This gradation of mental faculties originates from the number or paucity of instincts bestowed on particular species, joined to the greater or smaller power of extending or modifying these instincts by experience and observation" (1, 62). Smellie feels, therefore, that the explanation of man's superiority to the other animals is that he has more instincts: "Traces of every instinct he possesses are discoverable in the brute creation. But no particular species enjoys the whole. On the contrary, most animals are limited to a small number" (1, 152). He concludes that an animal

45 Others such as Hartley, Priestley and Erasmus Darwin denied the need for instincts, and argued that man builds up his ideas, not from instincts, but from mechanical associations of ideas.

with only a few instincts will always act strongly and steadily, while man, who has a large number of instincts, will have great difficulty in choosing a course of action. Smellie's view of the mind is remarkably simple, and largely mechanical: "A being actuated by a great variety of motives must necessarily reason, or, in other words, hesitate in his choice" (1, 152). Here "reasoning" seems almost to be equated with "hesitating." As did Locke and Hartley, Smellie imagines the mind's being acted upon by something like the pressures or weights of various competing impressions.

Instinct, for Smellie, is "an original quality of the mind" (1, 155), so that it is impossible to say anything further about the nature of any particular instinct. All one can do is observe which species have which inherent instincts, and the extent to which these can be "modified, compounded, or extended" (1, 154). For instance, in man, Smellie remarks that "Devotion is an extension of the instinct of love to the First Cause, or Author of the Universe" (1, 153). This theory of instincts also allows Smellie to solve or side-step the problem of the relation of mind to matter. With a nod to Descartes' "Cogito ergo sum," he says simply: "Whatever feels, therefore, is mind" (1, 156); as a result, all animals, even insects, have minds.

Lucid and attractive, this theory of instincts obviously came to bother Smellie in its implications; for he was led to introduce modifications that are somewhat inconsistent. Whereas at the beginning he stresses that mental ability is a function of the number of instincts, in fact he ends by giving greater attention to the degree to which some instincts can be modified, and goes so far as to define three different types of instincts: pure instincts, instincts that accommodate themselves to peculiar circumstances and situations, and instincts that are improvable by experience and observation. Moreover, if Smellie were actually convinced of the instinctive nature of rationality, he would be hostile to influences that weaken instincts. But such is not the case. For instance, he sees the softening and moderating influence of society as generally beneficial. Although the instinct of love creates a "powerful law of Nature," he recognizes that many cases arise in society when man must break this law to be prudent (1, 270). Clearly this belief in the positive value of society sits uneasily alongside the belief in instincts, and suggests some major alterations on Smellie's part.
This surmise is born out when one looks at the early article that Smellie wrote on Kames’ *Sketches*. There Smellie takes a much stronger stand on instincts, when he claims: “Writers on human nature, if they have the discovery of truth for an object, instead of bewildering themselves in the obscurities of metaphysic, ought to investigate with diligence the oeconomy of wild animals, the only uncorrupted inhabitants of this earth.” 47 Smellie argues here that, since it is extremely difficult to know the nature of man “and his destination” because he has become so corrupted by civilization, what needs to be undertaken is a study of wild animals (the domesticated ones having been corrupted) so that their destinations can be deduced from their actions. These will then “afford the finest and most solid analogical deductions concerning the nature and instincts of man.” At this period of his life, Smellie was willing to take the theory to its logical extreme to develop a model of man, based entirely on instinct. Needless to say, such a model is extremely rare at this time:

The instinctive actions of men, with their final causes, should be carefully studied. When these are fully ascertained, they ought to be considered as unalterable laws of our nature. Every deviation from these laws, though sanctified by custom, and enforced by precept, is essentially vicious. 48

With a fine turn of phrase, Smellie alleges that man is the most immoral of all animals because he is the wisest. How so? Because his mind supplants and mystifies his instincts: instead of following his true instinctual bent, man is led astray in a plethora of capricious actions. The only remedy, Smellie suggests, is to study man, not as he pretends to be, or thinks he is, in “civilized” communities, but to see him afresh in his place “in animated nature at large,” 49 by means of a study of the relationship between instincts and purposes in other animals. Although the deductions about man would obviously be analogical, Smellie feels that a sufficiently large sample should validate them. It was this mode of analogical reasoning of which Smellie so approved in Kames’ *Sketches*, and which led him to begin his *The Philosophy of Natural History*.

Although Smellie was correct to emphasize the process of analogy in science, he is much less suspicious of its employment than was his

47 *The Edinburgh Magazine and Review*, 11 (1774), 431.
48 Ibid.
49 Ibid., p. 437.
acquaintance, James Hutton. At a number of points Smellie falls into the trap warned against by Hutton of using catch-all terms that allow of no precision, and then reasoning therefrom to conclusions. As an extreme, although not atypical, example of his method the following will serve. Smellie contends that all animals (and this includes man) "live equally long, and enjoy an equal portion of happiness" (1, 519). His reasoning is based on the rate of circulation of the blood which he believes observation shows is always faster in small, short-lived creatures than in large, long-lived ones. Since he believes that the rate of association of ideas roughly follows the pulse rate (raise a man's pulse with wine, and you quicken his sensations, he says), it follows that small, short-lived creatures live intensely, and therefore enjoy as much happiness as the more sluggish long-lived creatures. Moreover, "a rapid succession of ideas or impressions makes time seem proportionally long" (1, 518). Although ingenious the argument is clearly fallacious, since it depends upon similarities in language which may or may not have connections in fact: rate of pulse and rate of association of ideas; raising a man's spirits and raising his pulse; intense sensations and intense pleasure.\textsuperscript{51}

Interestingly enough, this extreme case of analogical reasoning occurs at a point where Smellie is desperately concerned to show the beneficence of nature. Time and again Smellie returns to this question to show how the patterns described by naturalists can give man reassurance about his place in the world, and always he is horrified by the incontrovertible fact that one species preys on another, and that individuals exist as a result of the survival of the fittest.

The mind is struck, and even confounded, with the general scene of havoc and devastation which is perpetually, and every where, presented to our view. There is not, perhaps, a single species of animated beings, whose existence depends not, more or less, upon the death and destruction of others. Every animal, when not prematurely deprived of life by those who are hostile to it, or by accident, enjoys a temporary existence, the duration of which is longer or shorter according to its nature, and the rank it holds in the creation; and this existence universally terminates in death and dissolution. (1, 374)

More alarming still is that man—the highest animal of creation—

\textsuperscript{50} A Dissertation upon the Philosophy of Light, Heat and Fire, pp. 7-8.
\textsuperscript{51} For a discussion of this type of mistaken reasoning in eighteenth-century science, see Donald Davie, The Language of Science and the Language of Literature, 1700-1740 (London, 1963), pp. 41-63.
does not attempt to right the situation. As Smellie acknowledges sorrowfully, "the rapacity of man has hardly any limitation" (1, 375). Honest enough to admit that this cruel, or seemingly cruel system is a mystery that man can never hope to unravel, Smellie gallantly plunges forward to show some "advantages" of the system. He gives the familiar explanation that, if one species did not feed upon another, then species would multiply in such numbers as to exhaust the food supply.52

After all the "advantages" have been exhausted, however, Smellie still finds himself with a bleak picture, not so very different from the orthodox, Augustinian view of "fallen man." At the end of Volume 1, he concludes:

Even in our present condition, the sameness and insipidity of objects and pursuits, the futility of pleasure, and the infinite sources of excruciating pain, are supported with great difficulty by cultivated and refined minds. Increase our sensibilities, continue the same objects and situation, and no man could bear to live. (1, 526)

But this picture of man, derived from treating man as an animal among animals, accounts for only one side of Smellie. He is also a man of the Enlightenment, a philosopher whose study of animal behaviour was undertaken to reveal how man should and would be able to act in the future. Looking back at the enormous progress made in the sciences in the seventeenth and eighteenth centuries (including natural history, of course) Smellie celebrates man's coming rise above a bestial state to unknown heights of civilization:

How far this progress of science, and the peaceful arts of life, by the accumulation of ages, may proceed, it is impossible to determine. But the time, it is to be hoped, is not very remote, when the fiercer contentions of nations will cease, when selfishness and venality, which at present seem to be inseparable from commercial states, will give way to generosity of temper, and uprightness of conduct. (1, 102)

This is the utopian dream, so much a part of philosophic, scientific thought at this period, which was to fascinate later poets such as

52 With regard to man, however, he is not satisfied with the argument—already employed by Wallace, and to be used to great effect by Malthus in a few more years—that population would outstrip production if there were no wars (1, 387).
Coleridge and Shelley. Yet this utopian dream clearly conflicts with the deductions Smellie was able to derive from animal behaviour; this contradiction he was unable to resolve.

Part of the problem seems to lie in the very attempt to combine natural history and philosophy. Smellie claimed, and quite rightly as it would appear, that philosophers who have no natural history are "perpetually to be deceived," and that a naturalist without philosophy "is incapable of enriching our minds with general ideas" (1, 523). But Smellie was not altogether prepared to use the findings of natural history merely to understand better the reasons for man's complexity. His very choice of data and method of approach is often consciously or unconsciously aimed at buttressing beliefs that he already held dear, especially the belief that design implies providence. Yet this is not altogether unexpected; the employment of scientific data to explain "why" to any question is at the mercy of terminology and systems of thought. It is interesting to reflect that although few people today would deny Smellie's initial premise, that man must be studied in terms of the economy of other animals, this hypothesis has yielded surprisingly meagre results.

University of British Columbia