# David Hume: Grandfather of Modern Economics?

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**by Ken Binmore**

## 1 Introduction

The father of modern economics is universally acknowledged to be Adam Smith. But Adam Smith's intellectual father was David Hume.[2] Smith's opinion of Hume is made very clear in a letter dated Kirkaldy, 9 November, 1776, in which he writes to William Strachan about the manner of Hume's death. The letter concludes

> I have always considered him, both in his lifetime and since his death, as approaching as nearly to the idea of a perfectly wise and virtuous man, as perhaps the nature of human frailty will permit.

Adam Smith [20, 21] is recognized as the father of modern economics because many of its fundamental principles made their first appearance in his pioneering work. To what extent can we trace these ideas back to Hume?

In his own lifetime, Hume [12] was recognized as one of a new breed of political economists. The essays he wrote commenting on contemporary economic debates on finance and international trade are surprisingly modern in character and it is easy to forget that the ideas they express were often being put forward for the very first time. Alan Peacock [15] has written an excellent summary of this material which I do not think can easily be bettered.[3] Instead, I shall seek insights in Hume's [11, 10] philosophical works that can perhaps be seen as seeds whose final flowering appears in the work of recent winners of the Nobel Prize in Economics.

## 2 Rationality

Thomas Hobbes[9] said that one can characterize a man in terms of his strength of body, his passions, his experience, and his reason. In modern economics, Philo's[4] strength of body becomes his feasible set—the set of actions it is possible for him to take. His passions become his preferences. His experience is summarized by his

[1] I am grateful to the Arts and Humanities Research Council for funding this work through grant AH/F017502/.

[2] Although never formally acknowledged as such in Hume's lifetime because Hume believed that it would be bad for Smith's career if he were thought to have been mentored by an atheist. (Hume was certainly very skeptical indeed, but there seems to be no evidence that he was actually an atheist in the modern sense.)

[3] See also Schabas and Wennerlind [18].

[4] Philo and Cleanthes are protagonists in Hume's *Dialogues Concerning Natural Religion*.

beliefs. His reason becomes the set of rationality principles that guide his choice of an optimal action from his feasible set, given his preferences over the possible consequences and his beliefs about matters over which he has no control.

David Hume was the first to tie down the implications for rationality within such a formulation:

> Reason is, and ought only to be the slave of the passions, and can never pretend to any other office than to serve and obey them.

In this quote, Hume [11] denies that reason can tell us what we ought to want. Contrary to Immanuel Kant and numerous philosophers before and after, Hume argues that rationality is about means rather than ends. As he extravagantly put it:

> 'Tis not contrary to reason to prefer the destruction of the whole world to the scratching of my finger. 'Tis not contrary to reason for me to chuse my total ruin, to prevent the least uneasiness of an Indian or person wholly unknown to me. 'Tis as little contrary to reason to prefer even my own acknowledge'd lesser good to my greater, and have a more ardent affection for the former than the latter.

Modern economists have developed this doctrine into a theory that reduces rationality to nothing more than consistency. Not only must Philo's beliefs be consistent with his experiences, but his decisions (hypothetical as well as actual) must all be consistent with each other.

The Nobel Prize winner most associated with this philosophical position is Paul Samuelson [16]. David Hume [10] would probably not have approved of Samuelson's avowed aim of separating economics from psychology, but he would certainly have approved of the idea that we should pay attention to what people do rather than to what they say.

> Hear the verbal protestations of all men: Nothing so certain as their religious tenets. Examine their lives: You will scarcely think that they repose the smallest confidence in them.

Rather than speculating about what is going on inside someone's head, Samuelson's theory of revealed preference assumes that we already know what people choose (or would choose) in some situations, and uses this data to deduce what they will choose in other situations. For example, Philo may buy a bundle of goods on each of his weekly visits to the supermarket. Since his household budget and the supermarket prices vary from week to week, the bundle he purchases is not always the same. However, after observing his shopping behaviour for some time, one can make an educated guess about what he will buy next week, once one knows what the prices will be, and how much he will have to spend.

With appropriate consistency assumptions, it is possible to characterize Philo's choices by saying that he behaves as though trying to maximize the value of a utility function. Von Neumann and Morgenstern [23] and later Savage [17] added the finishing touches by incorporating uncertainty into the model. With the additional consistency assumptions of what is now called Bayesian decision theory, Philo behaves as though trying to maximize the long-run average value of a utility function relative to some subjective probability distribution (Binmore [6]).

# 3 Utility

Hume would have been rightly outraged at the naive but popular belief among modern economists that Bayesian decision theory solves the problem of scientific induction, but one may reasonably ask how well the modern concept of utility fits with his own use of the word, since Hume is commonly held by philosophers to be the first of a utilitarian succession that continues with Bentham, Mill and (so economists believe) ends with Harsanyi [7].

It certainly seems to be true that Hume was one of the first authors to speak of utility, but he uses the word in a manner that seems to me too distant from its later usage to justify his being counted as a utilitarian at all. When he refers to the public utility of some behaviour, he seems to be talking about its general usefulness rather than something that can be quantified in the modern manner. However, his usage seems closer to the modern orthodoxy than that of Bentham and Mill, for whom utility simply meant happiness or felicity. Hume [12] occasionally mentions happiness in such phrases as:

> The great end of all human industry is the attainment of happiness;

but there seems no suggestion that the ideal society is to be achieved by maximizing the sum of everybody's happiness. So I hope nobody is offering David Hume as an authority for the current craze for measuring the welfare of our nation by somehow quantifying our total happiness.

# 4 Equilibrium

In the context of perfectly competitive markets, Arrow and Hahn [1] argue that none of the classical authors, including Adam Smith, gave sufficient prominence to the fact that demand is as important as supply in determining equilibrium prices. But, as Alfred Marshall observed, demand and supply are like the two parts of a pair of scissors. It is only with Walras [24] that Arrow and Hahn believe the general theory of markets was finally put on a sound footing. My own view is that this desirable outcome was actually achieved only relatively recently, when game theorists succeeded in deducing Walrasian conclusions from the study of the Nash equilibria of certain games of incomplete information.

A Nash equilibrium is a profile of strategies—one for each agent—in which each agent's strategy is a best reply to the strategies of the other agents. Its relevance to economics lies in the fact that any trial-and-error adjustment process that always moves an agent towards higher utilities can only stop at a Nash equilibrium. John Nash [14] was awarded a Nobel Prize in 1994 for exploring the properties of the idea that now bears his name.

To what extent was something resembling Nash's notion of an equilibrium anticipated by previous thinkers? In reading Hume and earlier scholars such as Hobbes, one often feels that they are on the very edge of formulating a modern definition

of an equilibrium, but somehow they never quite make it. Hume [12] speaks of the balance of power and the balance of trade, using the analogy of water finding its own level in the latter case, but the emphasis both with Hume and others seems always to be on the process by means of which equilibrium is achieved rather than the structural properties of the end-product of the process. But without any information on the latter, how could one attempt any comparative statics?[5]

Some people speak of a Cournot-Nash equilibrium to recognize that Cournot anticipated Nash by more than a hundred years. Why was Cournot's work largely ignored by his contemporaries? My guess is that, like Hume and seemingly everybody else, they were focused on the equilibriating process rather than the equilibrium itself. Cournot did describe such a process (nowadays known as Cournot adjustment), but it is not particularly realistic. And who cares where an unrealistioc process is going? By contrast, Nash [14] unconsciously allowed the profession to refocus its attention on the properties of equilibria independently of the question of how they are achieved simply by not raising the question at all.[6] After a delay of more than twenty years, the result was a flowering of *static* economic models that heralded a new approach to imperfect competition that continues to this day.

I do not see any direct link with this work in David Hume's writings, but I think we must nevertheless credit Hume's determined naturalism with finally squashing the idea that some supernatural or metaphysical influence is necessary to explain how we manage to operate our societies. He understood that it is legitimate to explain that Philo did this because Cleanthes did that, and Cleanthes did that because Philo did this. The reasoning is circular, but that is the nature of equilibrium reasoning.

# 5 Folk Theorem of Repeated Game Theory

The idea that reciprocity is the mainspring of human sociality goes back nearly as far as there are written records. When Confucius was asked to encapsulate the "true way" in a single word, he is said to have replied *reciprocity*. Here is David Hume's

[5] In comparative statics, one examines how an equilibrium outcome varies with the environment.

[6] The editor removed Nash's brief comments on this issue as being of no interest! However, the literature on evolutionary game theory now confirms Nash's intuition that the fine details of an equilibriating process need not matter very much. Biologists therefore often discuss evolutionarily stable strategies (which necessarily generate symmetric Nash equilibria) without any reference whatever to the evolutionary process that generates them.

[11] explanation of how it works:[7]

> I learn to do service to another, without bearing him any real kindness, because I foresee, that he will return my service in expectation of another of the same kind, and in order to maintain the same correspondence of good offices with me and others. And accordingly, after I have serv'd him and he is in possession of the advantage arising from my action, he is induc'd to perform his part, as foreseeing the consequences of his refusal.

When various game theorists, notably Robert Aumann [2], reinvented this idea in the 1950s, they were totally unaware of Hume's work.[8] Since it was obvious to them that one-shot games have a limited range of application, they simply set to work to extend Nash's [14] newly minted equilibrium notion to repeated games—games played by the same agents over and over again. The result is called the folk theorem, because nobody knows to whom it should properly be attributed. It says that all interesting outcomes of a one-shot game are available as Nash equilibria in indefinitely repeated versions of the game—provided that the players care enough about the future and have no secrets from each other. No external enforcement agency is therefore needed to enforce contracts in such repeated situations, because nobody has an incentive to be the first to deviate from the terms of a contract that requires everybody to operate a Nash equilibrium.

The proof follows the lines proposed by Hume. The essential idea is that any deviation from a contract will be followed by some kind of punishment by the other players. The punishment may simply consist of withdrawing future cooperation as Hume suggests, but it could also be something much more pro-active. In his usual prescient style, Hume points out that if one player deviates by victimizing another, the punishment need not be admistered by the victim, but by some third player—a point commonly overlooked by those social scientists who think that all one needs to know about reciprocity is encapsulated in the strategy TIT-FOR-TAT.[9]

Hume [11] also understood that the number of players is important, because it is much easier for people to keep their bad behaviour secret in a large society:

> Two neighbours may agree to drain a meadow, which they possess in common; because 'tis easy for them to know each other's mind, and each may perceive that the immediate consequence of failing in his part is the abandoning of the whole project. But 'tis difficult, and indeed impossible, that a thousand persons shou'd agree in any such action.

Elinor Ostrom won her Nobel Prize in 2009 partly for exploring the political institutions that societies have evolved for coping with the monitoring problem in large societies that I think Hume must have been the first to identify in such clear terms.

[7] Behavioral economists would say that Hume is talking about *weak* reciprocity in this passage, whereas the laboratory evidence points to what they call *strong* reciprocity, according to which people do not reciprocate for instrumental reasons as Hume proposes, but because they like reciprocating. As in much else, their claims about what the evidence demonstrates are controversial.

[8] Robert Trivers [22] rediscovered the notion in 1971. He called it reciprocal altruism.

[9] The strategy says to start by cooperating in the repeated Prisoner's Dilemma, and to copy whatever the opponent did in the previous round thereafter (Axelrod [3]).

# 6 Convention

Tom Schelling won the Nobel Prize in 2006 alongside Robert Aumann. He studied the games of coordination of which social life largely consists. Like the Driving Game most of us play every day, such games have multiple Nash equilibria. Indefinitely repeated games provide an even better example, since the folk theorem tells us that they have an infinite number of (efficient) equilibria. Since rationality is helpless in deciding between such matters as whether we should drive on the left or the right, Schelling argued that we need social norms or conventions (which he called focal points) to ensure that we all coordinate on the same equilibrium. Or to put it more strongly, social norms can be seen as devices for selecting among equilibria in games with many equilibria.

There is no mention of David Hume in Schelling's [19] *Strategy of Conflict* but Hume [10] had made essentially the same point long before. He even commented on the equivalent of the Driving Game in the Edinburgh of his day:

> Waggoners, coachmen, and postillions have principles by which they give way; and these are chiefly founded on mutual ease and convenience. Sometimes also, they are arbitrary, at least dependent on a kind of capricious reasoning like many of the reasonings of lawyers.

However, Hume took the argument much further, thereby disgracing himself in the eyes of most modern philosophers[10] by supposedly reducing the fundamental principles on which our societies are based to the same status as traffic signals. Here is what is perhaps the most quoted passage of all from Hume's [11] work:

> Two men, who pull the oars of a boat, do it by an agreement or convention, although they have never given promises to each other. Nor is the rule concerning the stability of possessions the less derived from human conventions that it arises gradually, and acquires force by a slow progression, and by our repeated experience of the inconveniences of transgressing it. . . . In like manner are languages gradually established by human conventions without any promise. In like manner do gold and silver become the common measures of exchange, and are esteemed sufficient payment for what is of a hundred times their value.

The next passage extends the same reasoning to the authority of governments:

> Nothing appears more surprising to those who consider human affairs with a philosophical eye, than the ease with which the many are governed by the few, and the implicit submission with which men resign their own sentiments and passions to those of their rulers. When we inquire by what means this wonder is effected, we shall find that, as Force is always on the side of the governed, the governors have nothing to support them but opinion. It is therefore on opinion only that government is founded, and this maxim extends to the most despotic and most military governments as well as to the most free and most popular.

[10] Immanuel Kant was supposedly awakened from his intellectual slumber by reading a commentary on Hume. His denials of Hume's naturalism are still the prevailing orthodoxy among moral philosphers (particularly in the USA).

In short, the authority of popes, presidents, kings, judges, policemen, and the like is just a matter of convention and habit. Philo obeys the king because such is the custom—and the custom survives because the king will order Cleanthes to punish Philo if he fails to obey. But why does Cleanthes obey the order to punish Philo? That is to say, who guards the guardians? I wish it were possible to say that Hume had an answer to this perennial question, but I believe this is only to be found in the versions of the folk theorem that replace Nash equilibria by subgame-perfect equilibria (Binmore [4, p. 85]).

The philospher Lewis [13] pursued Schelling's line in his famous book *Convention.* The book gives David Hume proper credit for being first on the scene, and I suspect it was largely responsible for restoring Hume's reputation among analytic philosophers as one of the truly great thinkers. But Lewis takes Hume's iconoclastic view that nothing justifies even our most sacred conventions but opinion much too far. He claims that conventions cannot work unless they are common knowledge, which means that everybody must know the convention, everybody must know that everybody knows, everybody must know that everybody knows that everybody knows, and so on. But such a severe requirement would require us to say that it is not conventional to speak French in France! (Binmore [5])

I think Lewis's mistake is to try to use rational (or eductive) game theory as a framework within which to fit Hume's notion of a convention instead of evolutionary (or evolutive) game theory, which is much better suited to the task. As Hume [11] says: conventions arise gradually, and acquire force by a slow progression, and by our repeated experience of the inconvenience of transgressing them.

# 7 Mechanism Design

Here is what is perhaps the most misunderstood of all passages in Hume [11]:

> In constraining any system of government and fixing the several checks and controls of the constitution, every man ought to be supposed a knave and to have no other end in all his actions than private interest.

Hume is not saying that all men are always knaves. He is saying that, when designing a permanent organization, one should accept that if power can be abused, then it will eventually be abused. Those who initiate abuses usually invent stories that allow them to justify their abusive behaviour to themselves; and once a climate of abuse has become habitual, other people find it hard to resist the disapproval of their fellows by trying to climb out of the basin of attraction of the abusive convention. The recent scandal over MPs expenses is an example with a farcical flavour, but there is no humour to be found in the reports of the ill treatment of helpless old people in care homes, or the callous neglect of patients in NHS hospitals.

Insofar as it is possible to deal with these problem at all, Hume argues that organizations should take the eventual emergence of knavery for granted and set up rules and incentives that minimize the extent to which knaves can prosper. I do not

know to what extent the founding fathers of the American Republic were conscious of their debt to Hume when they wrote a constitution that split the exercise of power between three entities that were intended to be independent of each other, but whether they knew it or not, they were following Hume's prescription.

The same goes for Leo Hurwicz, Eric Maskin and Roger Myerson in their work on mechanism design that won them a Nobel Prize in 2007. Mechanism design takes up Hume's challenge by designing games in which the agents to whom power is delegated are treated as players. The checks in the constitution are the rules of the game. These are used to prevent a player going off the rails in situations that the designer can effectively monitor and evaluate. However, it is the controls that are more important, since these apply to decisions that the designer cannot monitor, or does not know how to evaluate. To get the players to act in accordance with the designer's aims rather than their own in such situations, it is necessary that the payoffs of the game be carefully chosen to provide the right incentives. The long-run behaviour of the agents is then predicted by finding a suitable Nash equilibrium of the game. All the players are thereby modeled as simultaneously "acting like knaves" by seeking only their own personal interest.

Mechanism design is perhaps the most successful contribution that microeconomic theory has made to economic practice ever. Its use in designing big-money telecom auctions has been particularly important. For example, the money raised at the British 3G auction in the year 2000 would have been enough to take 10p of the rate of income tax in the following year—if it had not been largely wasted on meddling in the NHS in a manner that proved ineffectual because it neglected the principles of mechanism design.

# 8 Behavioral Economics

Samuelson's attempt to separate economics from psychology was hailed in its time as a major advance, but is now under attack from behavioral economists who feel that the time has come to bring psychology back into economics. Their position on this subject seems more than a little inconsistent to me, since one of their avowed intentions is to dispense with the "selfishness axiom" on which their more extreme exponents insist that neoclassical economics is based. (Henrich *et al* [8]). But much of the point of Samuelson's theory of revealed preference would be lost if its function were merely to differentiate between the various ways that people might exhibit their supposedly selfish natures.

In particular, there is nothing in the foundational assumptions of neoclassical economics (or in the classical economics to which behavioralists have partly reverted) that denies that people may have social or other-regarding preferences that reflect their concern for people outside their circle of family and friends. Game theorists can handle such other-regarding preferences without any difficulty simply by building any social inclinations of the players into their payoffs in the game to be studied. As the Chicago school used to say: *De gustibus non est disputandum.*

It is true that experiments aimed at confirming or denying economic predictions in the laboratory were very badly received at first. I recall my own early attempts being scornfully dismissed with the observation that I was so ignorant that I didn't even know that economics is not an experimental science. But those days are long past and experimental work is now part of the economic mainstream, with a Nobel Prize going to Daniel Kahneman and Vernon Smith in 2002. However, there is seldom any reference to David Hume's strong interest in human psychology in this work, although he was the leading figure in what foreigners called the British psychological school of philosophers.

I believe that Hume's [11] emphasis on the human capacity of sympathizing with others is particularly important:

> No quality of human nature is more remarkable, both in itself and in its consequences, than that propensity we have to sympathize with others, and to receive by communication their inclinations and sentiments, however different from, or even contrary to our own.

The idea is the basis of John Harsanyi's [7] theory of interpersonal comparison of utility that is one of the two foundational planks of his revival of utilitarianism in recent years. (He got his Nobel Prize in 1994.) However, more on David Hume's views on sympathy (and empathy) would be inappropriate here since Alan Kirman is to give a companion lecture entirely devoted to this subject.

# 9 Conclusion

This lecture has been an attempt to look beyond David Hume's prescient contributions to what was then called political economy, and to focus instead on the manner in which his sceptical philosophical outlook became embedded in the foundational assumptions of modern economics. Perhaps better scholars than I could ever be will be prompted to take up the topic and give it the close textual attention it properly deserves.

However, one cannot close an assessment of Hume's work without commenting on David Hume as a great human being. Here is what I said about him at the end

of Chapter 3 of my *Natural Justice* (Binmore [4]):

> As the ancient skeptics taught, contentment is possible without the need to cling to comforting beliefs. As proof, we have the example of David Hume who lived an entirely admirable life without any belief in the supernatural. His personal example shows that nobody need feel gloomy because life has no ultimate purpose, or because conventional conceptions of moral responsibility are built on foundations of sand. So what if our fine feelings and intellectual achievements are just the stretching and turning of so many springs or wheels, or our value systems are mirrored by those of chimpanzees and baboons. Our feelings are no less fine and our values no less precious because the stories we have traditionally told ourselves about why we hold them turn out to be fables. In discarding the metaphysical baggage with which the human race bolstered its youthful sense of self-importance, Hume taught us that we throw away nothing but a set of intellectual chains.
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> Far from being dehumanized or dispirited, Hume was the most civilized, companiable, and contented of men—especially when compared with neurotic oddities like Rousseau or Kant, from whom the human race usually seeks inspiration on how best to live. Even on his deathbed, Hume retained his good humor, totally disarming Samuel Johnson's biographer, James Boswell, when he tactlessly quizzed him on how it felt to be at death's door without a belief in the afterlife. As Boswell reports, "Mr Hume's pleasantry was such that there was no solemnity in the scene, and death for the time did not seem so dismal."
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> In a less ghoulish deathbed conversation, Hume told Adam Smith that he had been reading Lucian's *Dialogues of the Dead*, in which various notables offer reasons to Charon why they shouldn't be ferried across the Styx. When his own time came, he proposed to say, "Have a little patience, good Charon, I have been endeavouring to open the eyes of the Public. If I live a few years longer, I may have the satisfaction of seeing the downfall of some of the more prevailing systems of superstition." But then, says Hume, Charon would lose all patience, "You loitering rogue, that will not happen these many hundred years. Do you fancy I will grant you a lease for so long a term? Get into the boat, you lazy, loitering rogue."
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> David Hume was right to predict that superstition would survive for hundreds of years after his death, but how could he have anticipated that his own work would inspire Kant to invent a whole new package of superstitions? Or that the incoherent system of Marx would move vast populations to engineer their own ruin? Or that the infantile rantings of the author of *Mein Kampf* would be capable of bringing the whole world to war?
>
> Perhaps we will one day succeed in immunizing our societies against such bouts of collective idiocy by establishing a social contract in which each child is systematically instructed in Humean skepticism. Such a new Emile would learn about the psychological weaknesses to which *Homo sapiens* is prey, and so would understand the wisdom of treating all authorities—political leaders and social role-models, academics and teachers, philosophers and prophets, poets and pop stars—as so many potential rogues and knaves, each out to exploit the universal human hunger for social status. He would therefore appreciate the necessity of doing all of his own thinking for himself. He would understand why and when to trust his neighbors. Above all, he would waste no time in yearning for utopias that are incompatible with human nature.

Would Adam and Eve be happy in such a second-best Garden of Eden? On this subject at least, Hume's own experience is immensely reassuring. We don't need to tell ourselves lies to be content. We don't need to believe that utopia can be achieved by some quick fix. It isn't even necessary to be optimistic that things will get better in the long run. We need only the freedom to create a stable microsociety within which we can enjoy the respect of those whose respect we are able to reciprocate. As Hume's example shows, even death can then be faced with equinamity.

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