

PHYSIOCRACY'S SCIENTIFIC FALLACIES

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I have approached Physiocracy for the past seven years that I've endeavoured to make sense of it, as an enigma. At times I have been wont to describe it as a game of Jeopardy to which we know the answer but need to find the question. For sure, I am skeptical of the discipline as a whole and its claims to science, and this informs my questioning, but even more, I remain perplexed by what Quesnay and his contemporaries thought they were resolving and why they found those answers satisfactory. In this paper, I wish to suggest that Quesnay's underlying quest and the arguments he put forward to bolster his theory answered a psychological yearning for "certainty" that arose from his experience and disillusionment with medicine. From Young Man Luther to Old Man Quesnay might be too presumptuous a leap, but the problem that recurs to me each time I approach Physiocracy is why so restricted a vision satisfied Quesnay and his disciples and why they allowed no alternate readings of the "evidence". Clearly, for them, the alternative was worse. A world dominated by the aleatory movements of goods, the whims of customers, the greedy hand of government, and worst of all, artificially enhanced value, was simply intolerable. Better the monotony of white bread and cider in a static reign of nature than the wild spending and speculation that would, down the line, lead mankind to perdition.

Some recent scholarship has stressed the ambiguities of the scientific project in general and its application to economics in particular.¹ Its use of mathematical models and statistical data has been subjected to internal and external criticism.² Such questions had arisen in the eighteenth century already concerning the application of models to economic phenomena, and, as of the early 1760s, when their system began to take form, Physiocrats became the targets of such attacks.³ Hard-core devotees could not be budged from the position that their doctrine corresponded to Nature's plan which, with the aid of simple precepts, would become wholly "self-evident". Historians of political arithmetic have evolved a narrative about the construction of statistical tables as of the late seventeenth century and the uses to which these were put,⁴ but it isn't clear why a model of economic circulation would arise in the mid-eighteenth century that would take an abstract, visual form, and why it would prove so tantalizing. What did such a leap toward abstraction serve?

The answer lies in part in François Quesnay's own intellectual trajectory. Born in 1694 in the Ile-de-France village of Méré⁵, Quesnay was the self-educated offspring of a down-at-heels farmer, packed off at the age of the seventeen to Paris by his widowed mother to be apprenticed to the Academy of Sciences' engraver Pierre de Rochefort. As part of his training, Quesnay attended public lectures at the Jardin du Roi, including anatomical demonstrations which spurred on a budding interest in surgery. This period of visual

¹ For example, Theodore Porter, *Trust in Numbers: the Pursuit of Objectivity in Science and Public Life* (Princeton, 1995).

² See the review of these debates in Jacques Sapir, *Les trous noirs de la science économique*, 2nd edition (Paris, 2003).

³ Among them those of Forbonnais, *Principes et observations oeconomiques* (Amsterdam, 1767).

⁴ A recent compendium revisits this: Thierry Martin, ed., *Arithmétique politique dans la France du XVIIIe siècle* (Paris, 2003).

⁵ No full-fledged biography of Quesnay has ever been attempted. Besides contemporary éloges and the extended articles of nineteenth-century érudits, Jacqueline Hecht's summary remains the soundest: *François Quesnay et la Physiocratie* (Paris, 1958), I, 211-93.

observation and reproduction of the natural world evidently marked Quesnay, although later in life he expressed little outward appreciation for the fine arts as such, except to note that they were more acceptable than poetry. It was the incapsulation of information in a drawing that impressed him and he would later describe the mind as working in images (the term he uses being “tableau”) which it then translated into words.⁶

Quesnay’s last medical project, it should be noted, sketched out in 1760 although never completed, was a study of sight.

Quesnay’s training as surgeon proceeded apace and he moved to Mantes with the position of surgeon. He made enough of a mark as *accoucheur* to come to the notice of neighbourhood nobility and eventually with the aid of patrons to have his *entrées* in Parisian salons. As a medical theorist, Quesnay enthusiastically endorsed the iatromechanism he learned from Boerhaave’s writings, and applied it to arguments about the circulation of the blood aided by mechanical contraptions.⁷ This would make his reputation as an innovative surgeon and bring him to the attention of those who were endeavouring to raise the status of surgery and in particular to free it from its association

⁶ *Essai physique sur l’oeconomie animale* (Paris, 1747), III, 346. “Les idées que nous rassemblons et que nous comparons se présentent à l’esprit par les rapports qu’elles ont entr’elles, et l’esprit les comprend sous un même aspect et se soumet à l’évidence; *tout lui est présent comme dans un Tableau, et il suffit qu’il voye avec évidence pour être assuré de la vérité qu’il voulait connaître exactement*, mais lorsque nous voulons faire connaître aux autres cette vérité avec la même évidence à laquelle nous sommes rendus, il faut énoncer successivement les idées qui nous ont conduit à la certitude.” [my emphasis] And this relates to the way he presents his image to his follower Mirabeau. Quesnay saw his *tableau économique* as self-evident. As he put it to the mystified Mirabeau: “I have attempted to draw an image of the fundamental economic order that displays its expenditures and its products in a fashion easy to grasp and that enables one to judge clearly the well-being and disarray that governments can produce; you will see for yourself whether I have achieved my aim.”⁶ A few days later, he had to concede that the diagram was not as self-evident as he’d like. “Madame de Pailly tells me that you are still mired in the Zizac. It is true that it pertains to so many things that it is difficult to grasp its coherence or rather to grasp it with certainty. The zizac shows what is, without showing how it comes about, which is not enough for you.”⁶

⁷ *Observations sur les effets de la saignée, tant dans les maladies du ressort de la médecine que de la chirurgie, fondées sur les lois de l’hydrostatique* (Paris, 1730).

with barbers. Quesnay became the surgeons' spokesman in the struggle for a separate guild, producing tract after tract to bolster their position with the use of historical charters and documents.⁸ This was principally an exercise in rhetoric where Quesnay learned to deploy argumentative strategies, which he had no problems reversing several years later when he defended the now-liberated surgeons from encroachments by the doctors. Having argued that surgery was an intellectual profession to separate surgeons from barbers, Quesnay now defended their practical skills and on-the-job training against the doctors' claims to supervise their education. Quesnay's successes in both cases appear to have bred a cynicism about the use of discourses –a mistrust of words that he expressed openly in later life.

We know little about Quesnay's surgical practice beside the fact that he found it burdensome and was relieved to become personal physician to the duc de Villeroy. It was while accompanying the duke on military campaign that in 1745 Quesnay obtained a degree in medicine from Pont-à-Mousson –in other words a bogus degree but one necessary for advancement. His rise was then meteoric, becoming Mme de Pompadour's personal doctor, lodged wherever the Court resided, since he was expected to be in constant attendance to his fragile mistress. What we know of his ministrations consisted principally in *tisanes*. Not only did he serve them to the King and favorite to cure their ills⁹, he did so as well to the convulsing Duke of Buccleugh, whose travelling companion Adam Smith appealed to him several times in desperation when no other doctor could be

⁸ *Lettres sur les disputes qui se sont élevées entre les médecins et les chirurgiens* (Paris, 1737-8) and later the *Recherches critiques et historiques sur l'origine, et les divers états et sur les progrès de la chirurgie en France* (Paris, 1744).

⁹ See *Mémoires sur Louis XV et Madame de Pompadour* by Madame du Hausset (Paris, 1985) p.47 for example.

found at Compiègne.¹⁰ The patient eventually died. Quesnay and his confrères must have taken more vigorous measures to save the Dauphin from smallpox, for each was rewarded with a title of nobility in 1752.¹¹

Even if he practised reluctantly, Quesnay contributed actively to the literature on surgery, as first permanent secretary of the newly founded Academy.¹² His work focused on the degeneration of bodily fluids which as an iatromechanist Quesnay continued to endorse as the core of physiology. He composed lengthy tomes on the circulation of the blood, on suppuration, gangrene, putrid fevers and so on, but produced almost no practical research.¹³ Rather, he appeared to view himself as popularizer of others' work, or more ambitiously, as Louis XV is said to have called him, a *penseur*. As a matter of fact, Mme de Pompadour concocted for him a coat-of-arms composed of three pansies, or *pensées* (in French) based on this reputation.

¹⁰ *The Correspondence of Adam Smith*, edited by Ernst Campbell Mossner and Ian Simpson Ross (Oxford, 1977) letter to Charles Townsend, 26 August 1766, pp.114-5. The Duke died in Paris on 19 October of that year. "I sent for Quesnay, first ordinary physician to the King. He sent me word he was ill. I then sent for Senac; he was ill likewise. I went to Quesnay myself to beg that, notwithstanding his illness, which was not dangerous, he would come see the Duke. He told me he was an old infirm man, whose attendance could not be depended on, and advised me, as his friend, to depend upon De la Saone, fist physician to the Queen. I went to De la Saone, who was gone out and was not expected home till late that night. I returned to Quesnay who followed me immediately to the Duke. It was by then seven at night. The Duke was in the same profuse sweat which he had been in all day and all the preceding night. In this situation Quesnay declared that it was improper to do anything till the sweat should be over. He only ordered him some cool tisane drink. Quesnay's illness made it impossible for him to return next day (Monday) and De la Saone has waited on the Duke ever since, to my entire satisfaction."

¹¹ AN P2594, Registre des Chartres, annoblissement a François Quesnay, l'un des médecins consultants du Roy, folio 29-31 based on arrêt given at Fontainebleau in October 1752 and registered 5 April 1754; Z1a 603, # 139. Arrêt d'enregistrement des lettres de noblesse du Sr. Quesnay, médecin, 5 mars 1755; Z1a 604, enquête de noblesse, 25 février 1755.

¹² He both edited and contributed to the first volume of the *Mémoires de l'Académie royale de chirurgie* (Paris, 1743).

¹³ *Observations sur les effets de la saignée* (1730), *L'art de guérir par la saignée* (1736), *Traité de la suppuration* (1749), *Traité de la gangrène* (1749), *Traité des effets de l'usage de la saignée* (1750), *Traité des fièvres continues* (1753). The articles can be found in the first volume of the *Mémoires de l'académie royale de chirurgie* (1743). His article "Mémoire sur le vice des humeurs; dans lequel on établit les principes physiques qui doivent servir le fondement à la doctrine de la suppuration, de la gangrène, des tumeurs, des ulcères et d'autres sujets de chirurgie", 150 pages in length, set out the program of study of the remainder of his medical oeuvre.

In his writings, Quesnay attempted to sort out the causes and effects of illnesses. With the decline of support for iatromechanism and its replacement with what has been called 'eclectic iatromechanism',¹⁴ Quesnay was hard put to find a single explanation for individual diseases and even less a unifying theory. Sometimes he bemoaned this fact, reviewing a whole series of explanatory frameworks and dismissing each in turn: mechanical, chemical, etc... and at others surmounted his distress by proposing a possible source or power behind all physiological phenomena, his favorite being ether (in the Newtonian vein).

For Quesnay, surgery (and medicine) remained at bottom inductive. The surgeon's craft rested on two sources of truth: observation and experimentation.¹⁵

Nature only reveals itself obscurely to our eyes; we must therefore scrupulously watch its progress, follow all its twists and turns and observe its effects. Yet in observing, the mind remains a spectator, seeing only the surface of things; with the help of physical experimentation, one must try to penetrate to the deepest sensory (*sensibles*) recesses of Nature, in order to surprise it, interrogate it, and force it to reveal herself.¹⁶

Checked against each other, observation and experimentation would get at what he termed "hidden truths" or underlying causes. Yet observation risked being partial or misleading. Why else would it have yielded incompatible medical and surgical theories? "Practitioners disagreed the more obstinately, the more they believed that nature expressed itself on their terms."¹⁷ The Ancients might have misunderstood bloodletting but based

¹⁴ See Laurence Brockliss and Colin Jones, *The Medical World of Early Modern France* (Oxford, 1997).

¹⁵ *Mémoires de l'Académie royale de chirurgie* (Paris, 1743) "Préface" (p.83) "Il y a donc deux sources d'où découlent les vérités qui peuvent enrichir notre art; savoir, l'observation et la physique expérimentale."

¹⁶ "La Nature ne se montre qu'obscurément à nos yeux; nous devons donc examiner scrupuleusement sa marche, la suivre dans tous ses détours, et observer ses effets. Mais dans l'observation, l'esprit n'est que simple spectateur; il ne voit que les choses en dehors des objets: il faut à l'aide des expériences physiques, chercher à pénétrer jusqu'aux principes de la nature, c'est-à-dire, qu'il faut la prévenir, l'interroger, la forcer à se découvrir."

¹⁷ "Les praticiens étaient d'autant plus obstinés dans leurs dissensions, qu'ils croyaient que la nature s'expliquait en leur faveur."

their conclusions on what they thought they had observed. They had been equally mistaken, he continued, about the nature of tumours and the treatment of engorged wounds. Their prejudices supported by their observations took centuries to correct through experimentation *combined with* observation.¹⁸ Knowledge was therefore a cumulative process involving a chain of observations and experiments that provided new data which could be tested further –in best inductive fashion.

It is clear, therefore, that insights into the art of healing are the fruit of an infinite number of practical observations, physical experiments, and the endeavors they encourage. Experiments and observations carried out by a single man do not suffice for such insights. They arise from the collection of observations dispersed in the works of our predecessors and contemporaries. Without this, the greatest genius would remain an unenlightened and presumptuous practioner.¹⁹

Although a supporter of the experimental method, Quesnay expressed some reservations. Since erroneous theories had all been backed by evidence, he urged practitioners to beware of partial evidence and not to generalize from weak samples.²⁰

Precaution was also necessary in distinguishing between cause and effect in the treatment of diseases since its was the effects that one observed. What physician, Quesnay

¹⁸ Elsewhere, he says the opposite, approving of much of what the Ancients had to say about disease: "Their entire approach to the treatment of fevers was based on the operations of nature itself. The further we strayed from the teachings of these great masters, the more we erred; the more we credited false ideas, the more we fell into shameful ignorance, and the more medicine harmed mankind." *Traité des fièvres continues* (Paris, 1753), pp.132-3.

¹⁹ "Il est donc certain que les lumières qui éclairent l'art de guérir, ne sont que le fruit d'une infinité d'observations de pratique, d'expériences physiques et de tentatives qu'elles suggèrent. Mais ce n'est pas des observations et des expériences d'un seul homme qu'on peut attendre de telles lumières. Il faut nécessairement recueillir les observations qui sont dispersées dans les ouvrages de nos prédécesseurs et de nos contemporains. Sans ce travail, le plus grand génie ne sera qu'un praticien peu éclairé et présomptueux."

²⁰ Such epistemological issues also prevade his introduction to his *Essai physique sur l'oeconomie animale* of 1747 which reviews various schools of medicine. Empirics are accused of trusting too much in experience and not giving enough weight to theory, rationalists are guilty of building facile theories that dazzle and *seduce* us (the mind is always weak in Quesnay's view) rather than following difficult paths that rouse real judgment. For we must separate true thought from the deceptions practised by the imagination. He vaunts therefore the experimental method with its self-verifying measures as the only one appropriate for doctors. Yet one must be especially careful about relying on observation in medicine because so much is hidden *inside* the body that it is hard to assess causes and effects with certainty.

wondered, “would dare claim he understood the mechanisms that lie behind different manifestations? Who would presume to reveal its hidden springs or pretend to explain the complex workings of such invisible forces? Only fools or charlatans, because these causes “are obscured in such deep shadows that we cannot possibly penetrate them”. Applying remedies to “effects” would not attack their cause. The illness would follow its natural course, assisted by what Quesnay calls “pure empiricism”, meaning the observation that some remedies can alleviate certain effects. This was not altogether a disaster since Quesnay saw himself as a disciple of Hippocrates (this was a widespread vogue) and a believer, hence, in the healing powers of nature itself.²¹ Yet, more often than not, Quesnay exuded not optimism but fatalism in the face of disease and a decided pessimism about man's capacity to unravel nature's secrets. “[Some physicians] have imagined that they could attack the causes of fevers straightaway and, in this way, spare Nature a fight whose victory is always uncertain.”²² But nature was neither a benevolent force nor easy to subdue.

Quesnay's doubts led to eclectic analyses and remedies.²³ His writing, best embodied in his 1753 *Traité des fièvres continues*, followed the same mode, typically including (1)

²¹ Quesnay considered that there had been three medical geniuses: Hippocrates, Galen, and Boerhaave, (though he was also critical of the latter), and found fault with all other medical theorists. *Essai physique sur l'oeconomie animale* (Paris, 1747), I, p.liv.

²² “Mémoire sur le vice des humeurs”, in *Mémoires de l'académie de chirurgie* (Paris, 1743) p.153.

²³ Unlike the systematizers that Foucault would have linked him to. Michel Foucault, *Les mots et les choses, une archéologie des sciences humaines* (Paris, 1966). See the critique of Quesnay's approach by Charles Daremberg, *Histoire des Sciences médicales* (Paris, 1870) II, p.1269. Take his suggestions for medications that would help contract arteries. They consisted of sedative plants like henbane and solanum, poppy leaves, opium, and mandragora, “refreshing” plants such as lettuce, pigweed, chickweed, and water lilies, but also frog spawns, liquid lead (*préparations de Saturne*), a light concoction of oxycrat (a mixture of water and vinegar), and whey”, followed by an equally whimsical list of astringents which ranged from plantain and red roses to chalk, alum, vitriol and ink. *Traité de la suppuration* (Paris, 1749), pp. 54-5. Chapter IV of the *Traité de la gangrène* (Paris, 1749), contains other remedies reminiscent of Etienne and

general methodological remarks; (2) a quest for underlying causes or principles; (3) an historical analysis and critique of previous approaches; (4) discussions of specific aspects of the malady and its treatments. Quesnay used standard authorities and borrowed from them his examples, including the very recent ones of his confrere the surgeon La Peyronie. The hydraulic model Quesnay constructed in the late 1720s offers a rare instance of engagement that went beyond simple cogitation. Otherwise, there are only occasional references to personal experimentation in his medical treatises. He seemed reluctant to perform vivisection on animals or to poke into corpses in his spare time, perhaps because he deemed experiments to be unreliable, providing contingent information that would require testing and retesting. Nonetheless, from time to time he yielded to the urge to verify a hunch, and tells of one experiment to test the proportion of liquid and solids:

I had fourteen ounces of the muscular flesh of an ox macerated in lukewarm water for a fortnight. I was careful to have the water lukewarm because too great a heat might have hardened the blood and lymph; I squeezed this flesh several times a day to draw out its juices (sucs) as soon as they were ready to pour out of the fibres that held them; I changed the water each time, in order to prevent rotting; I then took the flesh out of the water and let it dry slowly, and I weighed it when it was fully dry. Its weight of fourteen ounces had been reduced to two ounces two gros (?), so that the liquids which came out of this piece of flesh made up five sixths of its weight.²⁴

Yet for all that, he never evolved an experimental practice based on personal observation.

Other surgeons commonly referred to their own experiments. Albrecht von Haller's

essays on the circulation of the blood of 1754-6 summarize his dissections of frogs whom

Liébault's suggestions in 1578 of ways to relieve headaches accompanied by burning heat that affect harvesters in summertime: "Place slices of squash on their forehead or a cloth soaked in rosewater or plantain juice, black nighshade, lettuce, pigweed, and white wine vinegar, or beat two eggwhitess with rosewater and roll them in a headband fashioned from rough linen or wash the head in lukewarm water that has been cooked with vine or willow leaves, waterlily and rose petals, and even use it to wash the legs and feet." Charles Estienne and Jean Liébault, *L'Agriculture et maison rustique* (Paris, 1578), p.21.

²⁴ *Essai physique de l'oeconomie animale* (revised edition, Paris, 1747), III, p.91.

he mutilated in the service of science: severing limbs, watching them pulsate, placing them under the microscope and sometimes even reattaching them to see how they responded to stimuli.²⁵ Jean-Louis Petit's essay on tumours of the gall-bladder, included in the first compendium of the Academy, provides an example closer to home.²⁶ The brief piece describes a number of his own cases and concludes with a comparison of Petit's findings with those of other surgeons, including La Peyronie. On the other hand, Petit hazards only a few general remarks such as condoning *analogy*, meaning borrowing treatments used for other illnesses which he considers useful cross-fertilization.

Quesnay's article on trepaning, which follows, is a collection of thirty examples, all drawn from other surgeons.²⁷ There is no "Quesnay" case. Yet in the *Traité de la gangrène* published in 1749, Quesnay would recall suggesting to another surgeon at the siege of Ypres in 1743 that he put off trepaning the head wound of an officer of the king's guards.²⁸

I put it to him that there was no need yet for such an operation because hardly any humours had collected as yet, that it would be premature and harmful to open the tumour and that one ought in any case first to attempt a resolution. To this end, marine salt was dissolved in water and spirits (*eau-de-vie*); the tumour disappeared within three days and the patient completely recovered.

Distancing himself from raw observation, Quesnay limited himself to comparing others' findings, reducing them to a common practice with the frequent use of the indefinite

²⁵ *Deux mémoires sur la circulation du sang et sur les effets de la saignée fondés sur des expériences faites sur des animaux* translated by Tissot (Lausanne 1756).

²⁶ Petit, "Remarques sur les tumeurs formées par la bile retenue dans la vésicule du fiel, et qu'on a souvent prises pour des abcès au foie", *Mémoires de l'académie de chirurgie* (Paris, 1743), pp. 168-183.

²⁷ "Précis de diverses observations sur le trépan dans des cas douteux, où l'on recherche les raisons qui peuvent en pareils cas déterminer à recourir au trépan, ou à éviter cette opération", *Ibid.*, pp. 183-205.

²⁸ *Traité de la gangrène* (Paris, 1749), p.62.

article *on*. It appears that this was no accident for, as Toby Gelfand argues, the impetus behind surgical publications in the middle decades of the eighteenth century was primarily educational. The Academy of Surgery founded in 1731 aimed to provide syntheses of the soundest procedures culled from a multiplicity of sources, old and new, rather than to present cutting-edge discoveries that might prove erroneous.²⁹ Quesnay, instrumental in drafting its agenda, followed it to the letter.

For one yearning for an overarching explanation, however, medicine was bound to prove a disappointment. Whatever general principle(s) might be at work, individual bodies were frustratingly unpredictable. Everything in medicine was contingent. Some patients recovered, others died, and although physicians could try to lend nature a helping hand, they could never be certain of the outcome.

As Quesnay's medical texts grew longer, they meandered more and more. In the revised edition of the *Economie animale*, he digressed into long passages on the mind, on character, and even social institutions. Yet to categorize him as *médecin-philosophe* would be erroneous insofar as he did not apply medical thought to society but appeared to reject medical thought altogether as too complicated and unsatisfying. What he did do, however, is approach society through the lens of dysfunctionality. More than an encapsulation of how things worked, the *Tableau économique* or *Zigzag* was intended to reveal imbalances in exchanges which could then be redressed.

With the first calculations of the system in 1758 that Marmontel unkindly mocks in his *Memoirs*,³⁰ Quesnay was resolving the troubling relationship between particular cases

²⁹ Gelfand, pp. 103-111.

³⁰ . "Quesnay, logé bien à l'étroit dans l'entresol de Mme de Pompadour, ne s'occupait, du matin au soir, que d'économie politique et rurale. Il croyait en avoir réduit le système en calculs et en axiomes d'une

and general phenomena that had bothered him in his medical writing. Already, in a digression about social institutions, in the *Economie animale*, he had urged his readers to consider what was good for mankind as a whole rather than for a single individual.³¹ Nothing better reflects this switch toward aggregation than his newfound interest in agriculture.

His first assays in the field were exemplary, producing his best thoughts on the subject in the shape of two articles for the *Encyclopédie*, *Fermiers* and *Grains*, published in 1756 and 1757. There he moves from the simple to the complex, from specific cases to prototypes to national revenue and finally policy with more grace and fluency than he would ever display again. His rhetoric is impeccable: the arguments are laid out in simple mnemonic devices.

In "Farmers" he sets up a series of contrasts. On the one side are the six million acres (*arpents*) of productive and prosperous large farms, run by tenant-farmers, ploughed with horses, using triennial crop rotation. On the other lie the thirty million acres of poorer small farms, many sharecropped, dependent on oxen and biennial rotation. Although covering less acreage, the large farms produce the bulk of marketable cereals, especially wheat, and are therefore both the bread baskets and fiscal hope of the kingdom. The state has a duty to uphold the interests of farmers by rationalizing taxation, freeing the grain

évidence irresistible; et comme il formait une école, il voulait bien se donner la peine de m'expliquer sa nouvelle doctrine, pour se faire de moi un disciple et un prosélyte. Moi qui songeais à me faire de lui un médiateur auprès de Mme de Pompadour, j'appliquais tout mon entendement à concevoir ces vérités qu'il me donnait pour évidentes, et je n'y voyais que du vague et de l'obscurité. Lui faire croire que j'entendais ce qu'en effet je n'entendais pas était au-dessus de mes forces. Mais je l'écoutais avec une patiente docilité et je lui laissais l'espérance de m'éclaircir enfin et de m'inculquer sa doctrine. C'en eût été assez pour me gagner sa bienveillance. Je faisais plus, j'applaudissais à un travail que je trouvais en effet estimable, car il tendait à rendre l'agriculture recommandable dans un pays où elle était trop dédaignée et à tourner vers cette étude une foule de bons esprits. J'eus même une occasion de le flatter par cet endroit sensible, et ce fut lui qui me l'offrit." Jean-François Marmontel, *Mémoires*, (Paris, Mercure de France, 1999), pp. 172-3.

³¹ *Economie animale*, III, pp. 370-1, for he continues: Why is there such inequality if all are born same: this is part of past, present and future causes which act for the conservation of w whole guided by the designs of a supreme intelligence which has constructed the universe, governs it, and ensures its duration

trade from duties, tolls, and market controls, and by encouraging landowners to invest more in farming. Despite the common belief that Physiocrats pushed for clearance of wastes, Quesnay emphasizes that only certain soils are fit for wheat --and hence deserve sizable investments-- while poorer soils might be reserved for minor crops or used as pastures. Quesnay's article on "Farmers (political economy)" is ten times the length of Charles-Georges Le Roy's pendant "Farmers (rural economy)" which provides a superficial overview of farming.³²

The article on "Grains" (cereals) published in 1757 allowed Quesnay to revisit these questions in more depth for the article is twice as long. Quesnay orders his data into yet another series of contrasts, to great rhetorical effect. The difference between small and large farms is accompanied by an opposition Quesnay establishes between the world of farmers and that of artisans and merchants. Agriculture is truly productive whereas industry and trade are not; the one produces the essentials of life, the second is mired in useless luxury and frivolities. Lurking not far from the surface is a contrast between "reason" and "imagination", battling for supremacy. The associations get grimmer as we are led to understand that a false understanding of the sources of wealth has endangered the French economy and risks destroying the kingdom completely. Already population has fallen from 24 million in 1650 to a mere 16 a century later (Quesnay shared this common fallacy). Wealth does not lie in the export of luxury products and the accumulation of coin in the kingdom, it rests of course in the land, whose productivity and ultimate profits (the net product) are the true source of wealth. In a final rhetorical

³² "Fermiers (économie rustique)" in Volume VI (1756) of the *Encyclopédie ou Dictionnaire Raisonné des Sciences, des Arts et des Métiers*" edited by Diderot and d'Alembert, pp.527-528. Quesnay's article "Fermiers (économie politique)" followed pp. 528-540.

touch Quesnay attaches names to these dichotomous policies. Henry IV's minister Sully famed for "putting a chicken in every pot" and for engineering French reconstruction after the Wars of Religion, was a great supporter of agriculture, a good guy, quite unlike Louis XIV's minister, Colbert, who brought the country to rack and ruin, by his support of manufacture: a very bad guy indeed. This series of oppositions became a standard feature in Physiocratic writings. Just as significantly Quesnay laid out another important link, that between micro and macro, the produce of a big farm --as prototype of actual situations—when multiplied, yielding the national revenue. If the national economy continued to be conceptualized on the basis of the household, the full-fledged version of physiocracy and especially its visual model would jump to a further level of abstraction: focusing solely on exchanges at the national scale.

It no longer needs remarking that Quesnay had a peculiar relationship to mathematics, preferring simple arithmetical progressions when he calculated the creation of surplus value, or his reliance on ten-year averages in yields, than speculative modes such as probability theory.³³ This choice, which obviously hampered the “scientific” elaboration of Physiocracy, stemmed from a deep mistrust of the “unreal”. By happenstance, this resonated favourably with French administrators and political economists who had been deeply shaken –or so the standard story goes—by John Law’s speculative bubble and for whom long-term planning had not yet become a priority.

Physiocracy comes with a search for Truth and a homegrown version of evidentiary proof that Quesnay outlined in the 1757 *Encyclopédie* article *Evidence*. In this piece, Quesnay articulated his philosophy of mind. What emerges is a hodge-podge of Lockean

³³ See for example Philippe Steiner’s recapitulation in *La "science nouvelle" de l'économie politique* (Paris, 1998).

sensationalism and of Condillac's analytical approach. Whereas Locke had focused on the construction of ideas from simple to complex, one of Condillac's governing principles was that sensations and ideas are linked, stimulating further thoughts and ideas. Ideas could therefore be decomposed into their constituent elements by a process of analysis (on which Condillac rested his philosophy). This latter aspect would prove less appealing to Quesnay.

He opens his lengthy exposition with the brief statement: "the term evidence denotes a certainty so clear and manifest on its own that the mind cannot but yield to it".³⁴

Although there are two kinds of evidence, that of faith and that of the senses, he quickly adds that the evidence of faith is also rooted in the senses. In other words, God works through his material creation. When we know things for certain, we yield to this evidence in the way we do to the evidence of our senses. Man is the sum of his sensations: they make him aware of his physiological existence. Both animals and humans respond to their environments, both are able to sense, both experience and recall pleasant and unpleasant sensations and use them to survive. Their minds automatically register the information conveyed by the body. Unlike animals, however, man has been granted the additional capacity to choose, in other words, he is free and thus possesses a moral dimension that animals lack.

Information, always rooted in sensation, is automatically stored in memories and actively recalled through representations. These come in bundles established in the mind that Quesnay divides into *rappports essentiels* and *rappports nécessaires*, meaning inextricable connections and connection we come to perceive as logical or necessary. "Cause and

³⁴ "Le terme évidence signifie une certitude si claire et manifeste par elle-même que l'esprit ne peut s'y refuser." "Evidence" in Quesnay, II, (Paris, 1958), pp. 397-426, p.397.

effect" are among those basic phenomena that "cannot exist without the other" but we consciously observe patterns of specific recurrence and hence the existence of natural laws. Some linkages are universal but we also develop individual ones. Thus all human beings observe the alternation between night and day, but some of associations are clearly individual and reflect our *current* interests (insists Quesnay): thus a gun will recall hunting to someone presently keen on the sport whereas it will remind a soldier of war. What is more, if that individual lost a friend in battle, that friend's image will then appear to him. Our particular interests and quirks thus influence how we recall and associate things.

Implicit in Quesnay's discussion is the notion that sensations are trustworthy, except when the brain or body are severely damaged. All things being equal, if man heeds sensations properly, he will not err. This is because the animal spirits that pick up sensations transport them directly to the brain (or seat of the soul) where they are assembled, stored, and eventually recalled. Take a piece of ice. Next time you touch it, you will expect it to be cold and hard because: "there are specific and constant relations between sensations and objects and among sensations themselves which inform us with certainty (*sûrement*) about the relations between objects and the relations between these objects and ourselves."³⁵ Our senses "*yield an evidence or certain knowledge that we cannot deny*" and, through pain and pleasure guide our actions. (my emphasis).³⁶ This conformity between our sensations and the natural order furnishes us with "rules of

³⁵ "Qu'il y a entre les sensations et les objets, et entre les sensations mêmes, des rapports certains et constants, qui nous instruisent sûrement des rapports que les objets ont entre eux, et des rapports qu'il y a entre ces objets et nous."

³⁶ "En sorte qu'il y a une correspondance certaine entre les corps et les sensations qu'ils nous procurent, entre nos sensations et les divers effets que les corps peuvent opérer les uns sur les autres; et entre les sensations présentes et les sensations qui peuvent naître en nous par tous les différents mouvements et les différents effets des corps: d'où résulte une *évidence* ou une certitude de connaissances à laquelle nous ne pouvons nous refuser."

behaviour, guides our interests, enables what we call science, shapes our notions of happiness and woe, and grants us reasons for our actions".³⁷ All moral judgments are likewise associated with sensory evidence, goodness being what good people do, whereas false notions are caused by poor memory and faulty logic.

What is more, we check our memories against sensory evidence. Should we want to know whether we have remembered correctly where we set down a vase of flowers, we go take a look, verifying our recollection with the evidence of our eyes. Sensations thus inform us about the properties of objects around us and vouch for their existence, for only sensations are "complete, regular, immutable, and concord absolutely with these objects."³⁸ This is why innate ideas produced solely by the mind without external manifestation cannot guarantee their own verity. Such is man's lot: he is incapable of totally abstract ideas.

Anyone familiar with the sensationalist explanations of Locke or Condillac will find nothing new or striking here. Quesnay then proceeds to account for abstract thought and does so, again, in the fashion standardized by Locke and Condillac, by taking the system of connections and representations one step further. Man can use his memory to reconfigure what he has seen or experienced into new patterns (that which we call imagination), concocting for example mythical creatures that partake of a variety of animals, or coming up with new ideas by a logical chain of reasoning. This gives rise to

³⁷ "en cette correspondance que consistent, dans l'ordre naturel, les règles de notre conduite, nos intérêts, notre science, notre bonheur, notre malheur, et les motifs qui forment et dirigent nos volontés."

³⁸ "Il n'y a qu'elles qui soient complètes, régulières, immuables et absolument conformes aux objets."

the arts and sciences. Neither, however, can claim to be more real "than Tritons or Naiads".³⁹

Our sensations provide therefore two types of truth: real truths and ideal (or as he says speculative) truths. Real truths come from exact, evident links between objects and sensations; ideal truths are reached by connecting sensations alone, resulting in metaphysical, geometric, logical, and conjectural truths that are deduced from "factitious ideas or general abstractions."⁴⁰ In other words these ideal truths have become separated from the real source in sensations. They can therefore be misleading, distort evidence, and hence act as fodder for skepticism. This deviation takes place at the perceptual level where people not so much misread but disregard sensory data. Mathematical laws cannot err in this way because calculations render relations among objects exactly.⁴¹

This is an interesting departure from the conclusions recently reached by Condillac (and adopted by Diderot) that the links between sensations and ideas and then among ideas themselves are dynamic and creative. Quesnay reverts here to the more moralistic approach of Locke (not to mention Malebranche) for whom 'error' lurks in the separation

³⁹ "Les physiciens qui entreprennent d'expliquer des phénomènes dont le mécanisme est inconnu, se représentent des enchaînements de causes et d'effets, dont ils se forment des idées représentatives du mécanisme de ces phénomènes, lesquelles n'ont pas plus de réalité que celles des tritons et des naïades." And, "Il en est de même de toutes les abstractions morales, telles que les idées factices de bonheur, de malheur, de passions en général; elles ne nous sont compréhensibles que par le secours des sensations affectives que nous avons éprouvées par l'usage des sens. Il en est de même encore de toutes les abstractions relatives, morales ou physiques: telles sont la bonté, la clémence, la justice, la cruauté, l'estime, le mépris, l'aversion, l'amitié, la complaisance, la préférence, le plus, le moins, le meilleur, le pire etc.. car elles tiennent ou se rapportent toutes à des objets corrélatifs sensibles."

⁴⁰ "Les vérités réelles sont celles qui consistent dans les rapports exacts et évidents, qu'ont les objets avec les sensations qu'ils procurent. Les vérités purement idéales sont celles qui ne consistent que dans les rapports que les sensations ont entre elles: telles sont les vérités métaphysiques, géométriques, logiques, conjecturales, qu'on déduit d'idées factices, ou d'idées abstraites générales."

⁴¹ "Une règle d'arithmétique soumet décidément les hommes dans les disputes qu'ils ont entre eux sur leurs intérêts; parcequ'alors leur calcul a un rapport exact et évident avec les objets réels qui les intéressent."

of words from things, reminding us that, like his seventeenth-century predecessors, Quesnay's investigations of human understanding are impelled by a search for Truth. Memory allows Quesnay to refute the existence of innate ideas, for it acts as the channel between present and past sensations. Without this, we could never formulate "I think therefore I am" because we would be stuck in an eternal present. Those things we come to know as unshakably true, we grasp through observation and reiterated experiences, checked against our memories. This capacity might be god-given or innate, but man is not born with innate ideas. Evidence cannot arise by simple cogitation as Cartesians would have it but neither is it altogether impossible as skeptics maintain.

Indeed, the evidence by which our sensations reveal our sensory natures is the same which these sensations use to convey physical entities; in both cases this evidence is no more than a simple intimation [*indication*], based entirely on our sensations, with no other guarantee than these very sensations; yet this certainty takes hold of us and masterfully subjugates us.⁴²

Men come to communicate their ideas through words or other shared systems of signification, while realizing that there is no necessary link between these signs and actual sensations and that these signs can communicate lies as well as truths. They have recourse to language because this is the only way they can convey sensations and "reliance on such contrivances is a constant admission of their awareness of the incommunicability of sensations and of the separateness of their souls."⁴³ This incidentally serves as Quesnay's rebuttal to Spinoza about the unity of all creation.

⁴² "En effet, *l'évidence* avec laquelle nos sensations nous indiquent notre être sensitif, et *l'évidence* avec laquelle les mêmes sensations nous indiquent les corps, est la même; elle se borne de part et d'autre à la simple indication, et n'a d'autres principe que celle de nos sensations mêmes; mais cette certitude nous maîtrise et nous soumet souverainement." (p.415).

⁴³ "L'usage même de tels moyens est un aveu continuel de la connaissance que nous avons de l'incommunicabilité de nos sensations, et de l'individualité de nos âmes."

At this point, Quesnay suddenly veers in a different direction. Having established the primacy of physical stimuli, he now feels entitled to introduce the Creator who, having made man in his image, endowed him with consciousness and the capacity to choose.

This first cause and its never-ending act of creation are undeniably (*évidemment*) demonstrated to us; but our natural lights are not sufficient for us to fathom the way it acts upon us or how it is indelibly linked to our soul, because the soul has no intuitive grasp of the active principle behind its sensations, or of the passive principle that enables it to sense things.⁴⁴

We conclude that there must be some authority and intelligence behind final causes by observing how power and intelligence are manifested within ourselves. Since we have not manufactured them, we are led to acknowledge that whoever produced this power and intelligence in us, must also be powerful and intelligent. "We therefore cannot refuse the *evidence* of such truths as we observe in ourselves, and which demonstrate a force, intelligence, and meaningful intentions behind all that this first cause accomplishes within and outside ourselves."

Besides the capacity for choice, humans have been granted faith which "teaches them that the supreme wisdom is itself the light that guides [*éclaire*] all men who come into this world; that man's union with the very essence of intelligence raises him to a higher level of knowledge than beasts: for he gains knowledge of good and evil", which offers a guide

⁴⁴ "Cette première cause et son action qui est une création continuelle, nous est *évidemment* indiquée; mais la manière dont elle agit sur nous, les rapports intimes entre cette action et notre âme, sont inaccessibles à nos lumières naturelles; parce que l'âme ne connaît pas intuitivement le principe actif de ses sensations, ni le principe passif de sa faculté de sentir." And "On ne peut contester non plus que ces actes ne soient produits en nous par une cause distincte de nous-mêmes: or une cause dont les actes produisent et constituent les actes mêmes de notre puissance, de notre intelligence, est nécessairement elle-même puissante et intelligente; et ce qu'elle exécute avec intelligence, est de même nécessairement décidé avec connaissance et avec intention. Nous ne pouvons donc nous refuser à l'*evidence* de ces vérités que nous observons en nous-mêmes, et qui nous prouvent une puissance, une intelligence, et des intentions décisives dans tout ce que cette première cause exécute en nous et hors de nous."

to behaviour and enables him to exercise his freedom.⁴⁵ Quesnay thus re-establishes a duality within man: his body is the locus of sensations, but both sensations and reason, his "active, sentient, and intellectual" capacities arise from God acting directly upon the soul --albeit, he adds, more as a guiding light than as an active presence (addressing here, one presumes, Malebranchian occasionalism). Sensations yield pain and pleasure, but God grants us an awareness of right and wrong, good and evil. The soul is so constituted that it cannot choose to do both right and wrong simultaneously and, since it must opt for one or the other, it arguably is not completely free. Its freedom consists rather in being able to choose which path to follow, whether to yield to temptation or not. Hence, it can follow its instincts and act like a beast, or it can use its superior knowledge to secure its ultimate well-being which naturally accords with what is right.

Man relies on more than his inner sense for this: the functions within societies which have established customs, rules, and patterns of legitimate behaviour, instituted religions and governments that reward and punish. Societal laws thus affect him as do his intimate sense of right and wrong and his feelings of empathy, reinforced by his "natural awareness of the first principle and of the revealed wisdom to which all men are subject, which generate rules that govern all sensible and virtuous men."⁴⁶ All men are aware of what Quesnay calls this natural law, but they respond to it differently. Wise men do not quibble; they follow the moral path, yielding to this rule because they recognize its necessity. Those more passionate and less attuned to the rules, eventually obey them

⁴⁵ "Mais la foi nous enseigne que la sagesse suprême est elle-même la lumière qui *éclaire tout homme venant en ce monde*; que l'homme par son union avec l'intelligence par essence, est élevé à un plus haut degré de connaissance qui le distingue des bêtes; à la connaissance du bien et du mal moral, par laquelle il peut se diriger avec raison et équité dans l'exercice de sa liberté."

⁴⁶ "La connaissance naturelle d'un premier principe auquel nous sommes assujettis, et aux connaissances révélées forment des règles qui soumettent les hommes sensés et vertueux."

through fear of disgrace or punishment. For some, therefore, the very rules of morality suffice, whereas others wage a mighty battle against these rules, bowing to their animal selves (*l'exercice de la liberté animale, qui est toujours dans l'homme un désordre*) undone by passions caused by a poor constitution or bad habits that have not been repressed. In them, "the soul is then possessed by such strong and discordant feelings that they overpower all didactic sensations that could guide its actions; and this is why the natural order compels us to resort to the most severe punishments and chastisements to subdue perverted men."⁴⁷

The task Quesnay apparently set for himself was to reveal this fundamental --natural-- order, to impart its laws, and to make men obey them freely or by force. For without this knowledge mankind ignores or evades its true nature and purpose. The evidence of the senses is as nothing compared to the self-evidence of this far grander message. The syllogism here established goes as follows:

Men have minds
Evidence lies in the mind
All men are privy to evidence

Hence, men refuse to see this evidence only out of ignorance or subborness. Or even more pointedly:

Men have souls
The soul is the repository of our knowledge of the natural order
Hence all men can know the natural order.

This reasoning might account for the physiocrats' incomprehension of why others would deny what they saw as self-evident, but it does not explain why they accepted this form

⁴⁷ "L'âme est livrée alors à des sensations affectives, si fortes et si discordantes, qu'elles dominent les sensations instructives qui pourraient la diriger dans ses déterminations; c'est pourquoi on est obligé dans l'ordre naturel de recourir aux punitions et aux châtimens les plus rigoureux, pour contenir les hommes pervers."

of reasoning unconditionally themselves. This is how Condillac expressed his understanding of the nature of evidence in his *Logique*:

The evidence that we have just addressed and that I call the *evidence of reason*, as I have demonstrated, is nothing more than congruence (*identité*). This truth has to be really simple to have escaped all other philosophers, although they all seem so eager to ascertain the nature of evidence, which is never far from their lips.

I know with certainty (*évidemment*) that a triangle is a surface bounded by three lines, because, anyone who extends the meaning of these terms is saying, a *surface bounded by three lines* is the same thing as a *triangle*. Hence as soon as the nature of a triangle becomes self-evident to me (*que je sais évidemment*), I know its essence and this allows me to find there all of the properties of this figure.

In the same way, I would see all the essential properties of gold if I knew its essence... could observe all its facets...but we don't work that way. In fact each statement I make about gold, if it is true, involves a congruence. Take this one: *gold is malleable* by which I really mean: *a malleable object that I have observed being malleable and that I call gold is malleable*: a proposition where the idea involves a reiteration of itself.⁴⁸

This type of Evidence, Condillac is saying, is tautological, in the way of an algebraic equation where each side must be identical to the other. Buffon makes the same point.

Of the two types of supposed "truths" (a concept that Buffon finds loose and vague) those known as "mathematical truths are only truths of definition or, if one will, different expressions of the same thing."⁴⁹ Physical truths, on the other hand, are not arbitrary and do not depend on us: they rest on facts, on chains of similarities and repeated sequences. They are only probable, therefore, he adds, but this probability is so great that it becomes equivalent to a certainty. Abstract sciences yield evidence, but "real" sciences yield

⁴⁸Condillac, *La logique ou les premiers développements de l'art de penser* in *Oeuvres complètes*, Volume XV (Paris 1821-2) (Slatkine, 1970), pp.452-3.

⁴⁹ Buffon, *De la manière d'étudier et de traiter l'histoire naturelle* (Paris, 1986), p.66: "les vérités mathématiques ne sont que des vérités de définition ou, si l'on veut, des expressions différentes de la même chose."

certainties. "Mathematical evidence and physical certainty are then the only two perspectives from which we can approach truth."⁵⁰

For Condillac the other sources of evidence besides "reason" are facts and feelings:

Certain phenomena cannot be known through the evidence of reason (*l'évidence de la raison*): I only know them after having observed them, and I give to the certainty they arouse in me the name factual evidence (*évidence de fait*). I might also call factual evidence certain phenomena I observe within myself; but I refer to them as the evidence of sentiment (*évidence de sentiment*), because I know these sorts of facts through my feelings (*sentiments*).⁵¹

Compared to the definitions offered by such contemporaries as Condillac and Buffon, Quesnay's insistence on the existence of absolute truths and on man's capacity to know them by means of his --however-limited—mental equipment was part and parcel of Physiocracy's appeal to those who followed its logic closely. For it established parallels between Nature, the economy, and the mind's very processes.

Quesnay's endeavour as I have presented it here was a response to gnawing concerns about the possibility of finding the fundamental causes of disease, and then applying its cures to particular instances. The mind itself ceaselessly strove for such understanding, since it constantly processed and synthesized data. It was the mind's combinatory powers that drew Quesnay's attention, like that of his contemporaries. Single occurrences leave some mark, but it is repeated information that makes a real impact. Out of repetition patterns are born and lead to self-evident truths. Things only make sense in relation to other things, and so the mind constantly creates patterns. The distinction between necessity and chance is hence not at issue. Consciousness, like Nature, blips out the contingent. The mind knows how to put individual cases in perspective.

⁵⁰ *Ibid.*, p. 67: "L'évidence mathématique & la certitude physique sont donc les deux seuls points sous lesquels nous devons considérer la vérité." Buffon will object to moving away from the concrete to create abstract systems or models where real events have ceased to have any meaning. (p.73)

⁵¹ *Logique.*, pp.453-4.

It is therefore nature's intention that samples (grounded in the material evidence) be aggregated to yield truths, this is what is meant by evidence. Economics has no need of mind-games like probability which accord chance far too significant a role. Only repetition can yield useful truths and only such useful truths can be applied to society as a whole.

The *Tableau* itself might have been born, as Loïc Charles has recently argued, from Quesnay's observation of mechanical devices and water-clocks,⁵² or, as I am wont to privilege, from his conviction that images best embody nature's plan as the mind intuits it. Yet, in fact, we will never know for certain how he came to invent it. Quesnay concocted the model in isolation, even if scribbling feverishly in full sight (as Marmontel and the marquis d'Angivillers recall in their memoirs).⁵³ He did not present his findings to his confrères at the Academy of Sciences, neither to agronomists such as Duhamel du Monceau nor naturalists such as Buffon, to fellow-doctors, mathematicians, and so on and so forth. He chatted about it to agrarian-minded fellow courtiers like the Master of the Hunt Le Roy and eventually to the Encyclopedists who were attempting to bring his old acquaintance Goussier's project to fruition⁵⁴, but his reluctance to engage in scientific interchange makes him an oddball in the Republic of Letters.

What we do know is that once the *tableau* became available to a large public, it fascinated contemporaries⁵⁵ as it would later come to obsess Karl Marx.⁵⁶ For what

⁵² Loïc Charles, "The Visual History of the *Tableau Economique*" in *The European Journal of the History of Economic Thought* 10:4 (Winter 2003), pp. 527-550.

⁵³ *Op.cit.*, and *Mémoires de Charles Claude Flahaut, comte de la Billarderie d'Angiviller: notes sur les Mémoires de Marmontel* (Copenhagen, 1933).

⁵⁴ Elizabeth Badinter, *Les Passions intellectuelles, I, Désirs de gloire (1735-1751)*, p.324.

⁵⁵ : "Qu'est-ce qu'étoit que ce Zig-Zag du produit net? C'étoit une idée très juste, très sage, très exacte, très profonde, exprimée d'une manière très simple, et, pour me servir de l'expression de Quesnay, *en stile de*

Quesnay demonstrated, felicitously for some and questionably for others, was not so much that increasing taxation of the rich or of the poor (for both were bound to holler) in order *to get more revenue* --or, put another way, that land rather than industry was the true source of wealth-- would benefit the state, but rather than one could ground those calculations in nature's designs. And so the economic science that Quesnay and his followers claimed to be instituting found its niche in this reassurance, a burden that the discipline has assumed ever since. For it isn't so much the debates about this or that figure or of this or that policy that mattered most, but rather the notion that the aleatory could be reduced to order, be it through an invisible hand or a philosopher-king-overseer (the preferred solution of the physiocrats), and that nature could be controlled because it had inherent patterns. This is the promise of economics and the appeal of its models, diagrams, charts, and formulae. Just as in mid-eighteenth century it seemed to offer solutions to French fiscal problems, so ever since has it spoken to man's desire for certainty and control over a chaotic world. And in this vale of tears, every time the system goes seriously awry, it forces us to conclude, as in Quesnay's day, that it is Man's Fault.

notaire." (*Mémoires de Charles Claude Flahaut Comte de la Billarderie d'Angiviller, notes sur les Mémoires de Marmontel*, Copenhagen, 1933), p.13.

⁵⁶ Marx, "A Contribution to the Critique of Political Economy" *Economic Works 1861-63* in KarlMarx and Frederick Engels, *Collected Works*, Volume 31, (NY,1989).