JOURNAL OF
INTERDISCIPLINARY
HISTORY OF IDEAS

2022

Volume 11 Issue 22
Item 16

– Section 2: Articles –

Paper Money and the Fear of Excess in Late Eighteenth-Century Britain

by
David M. Batt

JIHI 2022

Volume 11 Issue 22

Paper Money and the Fear of Excess in Late Eighteenth-Century Britain

David M. Batt *

Paper money occupied a deeply ambivalent place in works of British monetary writers in the late eighteenth century. On the one hand, writers like Adam Smith and Jeremy Bentham thought that paper money's ability to represent wealth in exchange without itself containing any intrinsic value was an unparalleled benefit to commerce and industry. On the other hand, having disburdened itself of any intrinsically valuable commodity, the abstract monetary sign of paper money gave rise to a fear of excess, a fear that in essence there was nothing which could limit its growth. In this paper, I will discuss the concept of paper money as it took shape in the writings of eighteenth-century British monetary writers, introducing the idea of a general economy of notes to help explore the ambivalent place it occupied.

> while fitting these ingenious wings to Icarus, [Daedalus] gave him careful instructions on how to fly safely: he must keep midway between earth and heaven, neither too low, where the sea-spray might weigh down his wings, nor too high, where the flaming sun might scorch them. When they took off, Daedalus watched his son as anxiously as any parent bird its fledgling[1]

* University of Notre Dame (*dbatt @ nd.edu*).

[1] Jennifer R. March, ed., "Icarus", in *Cassell's Dictionary of Classical Mythology*, (London: Cassell & Co., 2001), 415.

Journal of Interdisciplinary History of Ideas 11(2022), 22, p. 16:1–16:41. Peer-reviewed.

1. Introduction

By the late eighteenth century, the concept of money which existed in the writings of British monetary writers had attained a certain epistemological coherence. Money had become a sign for representing wealth which derived its value from what it promised its bearer it would obtain in exchange, what Michel Foucault in *The Order of Things* called the pledge of money.[1] The idea of the pledge articulated at the heart of British monetary discourse allowed late eighteenth-century monetary thinkers to conceptualise the recently introduced monetary sign of paper money as a logical progression from the minted gold and silver coins it had come to replace.

In sections one and two, I will show that for Adam Smith, paper money was understood as beneficial to the operations of commerce and industry precisely because of its ability to represent value in exchange without itself containing any intrinsic value. Unlike a minted gold or silver coin whose representative ability was duplicated at least in part by its intrinsic, material value, paper money was understood to be a pure, representative sign, signifying its referent in an arbitrary manner, solely by the written signs and material traces impressed onto its surface. But, unlike commodity coins, whose guarantee was contained within the physical substance of the sign itself, paper money had to be guaranteed by something which was external to it. For Adam Smith, these guarantees were understood as limits to paper money's growth, restricting the ways in which paper money was issued into circulation and defining the conditions under which such abstract monetary signs could productively or usefully be employed in the emerging capitalist economy.

But there was a strange ambivalence at the heart of the new abstract monetary sign. On the one hand, late eighteenth-century writers like Adam Smith and Jeremy Bentham wrote approvingly of the benefits that paper money brought to the commerce and industry of their beloved nation. On the other hand, these same writers were cautious about the potential of paper money. Even though it was able to bring so much benefit to commerce and industry, the abstract monetary sign of paper money was always threatening to expand beyond its useful

[1] Michel Foucault, *The Order of Things: An Archaeology of the Human Sciences* (New York: Vintage Books, 1994), 166-174.

limits.

In sections five, six, and seven, I will introduce the idea of a *restricted economy of notes* and a *general economy of notes* to help explore the ambivalence between the inherent benefit of paper money and the fear of excess which it brought about. The concept of general economy is borrowed from the philosopher Georges Bataille in his book on political economy *The Accursed Share*. In the final sections of this paper, I will focus on two elements of general economy which will help us to understand the ambivalence at the heart of eighteenth-century concepts of paper money—extension and squander.

In conclusion, I will briefly discuss the relationship between the virtual character of paper money and its fear of excess. I will argue that the fear of excess is the logical endpoint of a restricted economy of notes, and, using Jacques Derrida's notion of the *pharmakon*, I will suggest that the way the virtuality of the abstract monetary sign gives rise to a fear of excess—both in the late eighteenth century and now—highlights a characteristic that the virtuality of paper money has as a *pharmakon*: its role as a scapegoat.

2. Money as a Pledge

The prototypical expression of the late eighteenth-century concept of paper money can be found in the pages of Adam Smith's *The Wealth of Nations* published in 1776. The first element of Adam Smith's concept of paper money was the explicit recognition of the nature of a coin as a monetary sign distinct from the commodities which it helped to exchange. Initially, Adam Smith tells his readers, gold and other precious metals like silver, copper, and iron, were used only in their raw bullion form, exchanging on the basis of their weight and purity alone.[1] In ancient Rome, he continues, up until the time of Servius Tullius in the sixth century BC, Romans had no coins but instead used unstamped bars of copper to purchase whatever it was that they needed. Eventually, both weighing and assaying raw, uncoined bullion gave rise to a modification that transformed precious metals into something quite different,

[1] Adam Smith, *An Inquiry into the Nature and Causes of the Wealth of Nations*, 3 vols. (London: Alex Murray & Son, 1812 [1776]), vol. 1, bk. 1, ch. 4, 35-37.

the inconveniency and difficulty of weighing those metals with exactness gave occasion to the institution of coins, of which the stamp, covering entirely both sides of the piece and sometimes the edges too, was supposed to ascertain not only the fineness, but the weight of the metal. Such coins, therefore, were received by tale [the nominal amount] at present, without the trouble of weighing.[1]

Certain practices such as weighing or assaying, which were formerly the basis upon which precious metals obtained their value in exchange, became externalised in what Adam Smith called the "public stamp"—a sign impressed onto the piece of metal that would make the metallic substance into a coin.[2] Indeed, "the public stamp upon coins", we are told by Joseph Harris, the King's assay master at the Royal Mint in 1757, "is a voucher and security to every one, that the coins that wear it, are of a certain fineness, and intrinsic value".[3] The *difference* which it was thought existed between coined money and uncoined bullion was the result of human labour and public authority, and—in Adam Smith's words—it was these that made coins "more convenient" compared to gold or silver bullion.[4] For Adam Smith, the monetary sign was not simply a certain quantity of precious metal which derived its value because it was itself valuable, it became the material embodiment of an *assurance* of value made visible by the stamp impressed upon its surface. In this sense, the value of a commodity coin depended in part on the existence of a difference or gap between the material form of the monetary sign and the ground of value it was capable of representing.

Writing in *The Order of Things*, Michel Foucault argued that the affixation of a public mark upon a metallic substance and the entire concurrent articulation of money as a sign capable of representing wealth that emerged in early-modern monetary discourse was the result of a unique disposition which defined money as a "pledge".[5] It was precisely this disposition which provided the epistemological foundation of the concept of money articulated in Adam Smith's *Wealth of*

[1] Smith, *The Wealth of Nations*, vol. 1, bk. 1, ch. 4, 38-39.
[2] Smith, *The Wealth of Nations*, vol. 1, bk. 1, ch. 4, 38.
[3] Joseph Harris, *An Essay upon Money and Coins Part I: The Theories of Commerce, Money and Exchange* (London: G. Hawkins, 1757), 48.
[4] Smith, *The Wealth of Nations*, vol. 1, bk. 1, ch. 4, 66.
[5] Foucault, *The Order of Things*, 181.

Nations. The material commodity from which the monetary sign was itself made was only the "means by which the whole revenue of the society is regularly distributed" and "makes itself no part of that revenue".[1] Money was merely a "great wheel of circulation" and was altogether different from the goods which were circulated by means of it, and which goods were the only true measure of value.[2] Justifying this distinction, Adam Smith distinguished the material of the monetary sign from the promise which it bore, and in doing so exemplified the nature of money as a pledge:

> When we talk of any particular sum of money, we sometimes mean nothing but the metal pieces of which it is composed; and sometimes we include in our meaning some obscure reference to the goods which can be had in exchange for it, or to the power of purchasing which the possession of it conveys.[3]

According to Adam Smith, there are two values that are contained in the monetary sign—two souls, as it were, jostling over the one body. This doubling of the monetary sign, this "unfortunate metonym",[4] as the philosopher Jeremy Bentham would later describe it, was a superposition of the value of the sign itself with the value that it signified. "The word money", Bentham tells us,

> has different meanings which it is important to distinguish clearly. It describes the means of circulation, metal that is coined and which has no other function than to pass from hand to hand in exchange for all kinds of things. In another sense which one can call figurative, it is employed for all these things themselves [for the things exchanged], for all modifications of wealth.[5]

To say that money was a pledge, however, is not to say that it was a token accepted by common consent, a mere social convention, it meant for Adam Smith and Jeremy Bentham that coined money has by virtue of the sign it bears "exactly the same value as that for which it has been given … coinage can always

[1] Smith, *The Wealth of Nations*, vol. 1, bk. 2, ch. 2, 429.
[2] Smith, *The Wealth of Nations*, vol. 1, bk. 2, ch. 2, 429.
[3] Smith, *The Wealth of Nations*, vol. 1, bk. 2, ch. 2, 430.
[4] Jeremy Bentham, "The True Alarm: A View of Paper Money, Its Good Effects, Bad Effects, and Their Remedies, and Its Connection with Real Wealth (1801)", in *Jeremy Bentham's Economic Writings: Critical Edition Based on His Printed Works and Unprinted Manuscripts*, ed. by W. Stark, vol. 3 (London: George Allen & Unwin, 1952 [1801]), 70.
[5] Bentham, "The True Alarm", 70.

bring back into the hands of its owner that which has just been exchanged for it … money is a material memory, a self-duplicating representation, a deferred exchange".[1] It was the promise presented by the stamp on the coin, the knowledge that it would ultimately be taken back again, that indicated to its holders the symmetry of exchange. And it was only in symmetric exchange, as the monetary sign travelled from one individual to another, exchanging for the "truly useful, but perishable supports of life",[2] ultimately finding its way back to the issuer from whence it came, that the pledge of the monetary sign—its material memory—was realised.

3. The Replacement of Coin by Paper Money

It was the belief of Adam Smith that when talking of particular sums of money, the value of that money properly referred to the goods which it could obtain in exchange, not the material sign itself. Despite the fact that coins still contained intrinsic value, only one of the two double meanings of money was the real source of value. "If a guinea be the weekly pension of a particular person", Adam Smith wrote, "his weekly revenue is certainly not equal *both* to the guinea *and* to what it can purchase".[3] In this way, the value of the monetary sign under the pledge becomes a deferred value. By possessing a monetary sign one did not properly posses any real value, only the means by which to obtain something of value.

Adam Smith emphasised this distinction by explicitly equating the value of a guinea coin with the value of the paper money which banks had been issuing

[1] Foucault, *The Order of Things*, 181.
[2] John Locke, *Two Treatises of Government* (London: Printed for C. and J. Rivington *et al.*, 1824 [1690]), bk. 2, ch. 5, sec. 47, 157.
[3] Smith, *The Wealth of Nations*, vol. 1, bk. 2, ch. 2, 432.

to the government and public for over 50 years.[1] What, asked Adam Smith, if an individual were paid in a bill for a guinea instead of a coin?

> His revenue surely would not so properly consist in the piece of paper, as in what he could get for it. A guinea may be considered as a bill for a certain quantity of necessaries and conveniences upon all the tradesmen in the neighbourhood. The revenue of the person to whom it is paid, does not so properly consist in the piece of gold, as in what he can get for it, or in what he can exchange it for. If it could be exchanged for nothing, it would, like a bill upon a bankrupt, be of no more value than the most useless piece of paper.[2]

In making the comparison between a guinea coin and a bill for a certain quantity Adam Smith illustrates the second element of his conception of paper money. Despite its intrinsic commodity value, a coin was merely a bill for a certain quantity of goods. It is important to emphasise this point. Adam Smith does not say that a bill can be considered as a coin, he says that a coin can be considered as a bill. In doing so he switches the usual ordering of the history of money with a logical ordering that rectifies an error whereby because metallic coins came first historically, they must have a quality of money that bills and paper do not. In other words, although Adam Smith may have thought that exchange and commodity coins were historically antecedent to paper money, we can see here that the concept of *credit* and the pledge it embodies was in fact for him *logically anterior* to the form that all money had to take.[3] Giving precedence to the pledge in this way was precisely to give precedence to the *money of account* as the defining feature of money. For it was in a common unit of account that the two separate pledges of the coin and the paper bill were measured and was thus the shared and necessary element that existed

[1] See: J. Keith Horsefield, "The Beginnings of Paper Money in England", *Journal of European Economic History* 6, no. 1 (1977): 117-32; John Clapham, *The Bank of England: A History*, 2 vols. (Cambridge, UK: The University of Cambridge Press, 1945), vol. 1, ch. 1; A.D. Mackenzie, *The Bank of England Note: A History of Its Printing* (Cambridge, UK: Cambridge UP, 1953), 3-13; Albert Edgar Feavearyear, *The Pound Sterling*, ch. 5; David M. Batt, "The 1783 Proposal of a Readymade Note at the Bank of England", *Financial History Review* 29, no. 1 (April 2022), 74-84.

[2] Smith, *The Wealth of Nations*, vol. 1, bk. 2 ch. 2, 431.

[3] A. Smith's account of historical evolution of money is in *The Wealth of Nations*, vol. 1, bk. 1, ch. 4; Geoffrey K. Ingham, *The Nature of Money* (Cambridge, UK: Polity 2004), 70 discusses the logical anteriority of the unit of account despite the historical anteriority of exchange.

between the two otherwise heterogeneous monetary signs. Indeed, at the end of the eighteenth century, an accountant, Thomas Smith, would articulate the dependence of money on what he called the "Standard Unit", and in so doing he exemplified the logical progression that Adam Smith had articulated before him,

> Gold Coin, and Paper Money, are exactly on the same footing, each being only a Symbol, or Token, of the Standard Unit of the Country; and, consequently, neither of them is entitled to be placed above or before the other [regarding their respective pledge].[1]

And this led almost inexorably to the third element of Adam Smith's conception of paper money. The only difference between a guinea coin and a paper bill for the same nominal amount, was not the value which they each represented as a monetary sign; but, rather, the physical material from which each was made. Both coin and paper money contained an equivalent pledge, but the former duplicated its pledge in the material from which it was made—that is, a coin was still made out of a valuable substance—whereas the latter, being made of only paper and ink, was not. Therefore, Adam Smith concluded, the replacement of coin with paper money would reduce the cost of maintaining a circulating medium, eliminating the redundancy of coin's metonymy.

> The substitution of paper in the room of gold and silver money, replaces a very expensive instrument of commerce with one much less costly, and sometimes equally convenient. Circulation comes to be carried on by a new wheel, which it costs less both to erect and to maintain than the old one.[2]

And so, by articulating a distinction between the monetary sign as a valuable sign and the monetary sign as a pledge, paper money was understood to emerge as an object capable of replacing coins. Paper money, it was thought, was exactly like a coin in that both monetary signs derived their value from a pledge that their nominal value would be the value they obtained in exchange. Paper money was, however, the pure sign, whereas coin was doubled because its pledge was duplicated, at least in part, by the value of the material from which it was made.

[1] Thomas Smith, *An Essay on the Theory of Money and Exchange*, 1st ed. (London: T. Cadell and W. Davies, 1807), 71.
[2] Smith, *The Wealth of Nations*, vol. 1, bk. 2 ch. 2, 434.

4. Guaranteeing the Pledge of Paper Money

The problem arose, however, of how the monetary sign could provide the assurance embodied in its pledge; how could it guarantee the continuity of the nominal unit and thus universal equivalence in exchange? Michel Foucault thought that it was here, in answering this question, that the monetary thinkers of the eighteenth century established their two major opposing positions with regards to money. "It is conceivable, in fact, that the operation that pledges the money is guaranteed by the marketable value of the material from which is made; or, on the other hand, by another quantity of merchandise, exterior to it, but linked to it by collective consent or the will of the prince".[1] The monetary sign, Foucault writes, could thus be linked with equal legitimacy to either something *internal* or to something *external* as a guarantee of its pledge.

For commodity coins it was an internal value, the marketable value of the gold, silver, or copper from which they were made that ultimately guaranteed the pledge.[2] According to Adam Smith the precious metals from which coins were made achieved their marketable value through the labour inherent in their manufacture. For the exchangeable value of any commodity was always "equal to the quantity of labour which it enables [one] to purchase or command" and it was precisely to bring gold and silver from the silent depths of the earth, to smelt, refine and forge it into a coin for the purposes of exchange, over which so much labour was spent and distant lands conquered.[3] Thus the amount of coins in circulation and their value was always dependent on the "richness or poverty of the mines" and the "quantity of labour which is necessary in order to bring a certain quantity of [it] to market".[4] The task, in this case, was not only ensuring that there was enough gold and silver being mined to satisfy the need for a coined circulating medium, but of ensuring that the marketable value of the material from which such coins were made was in agreement with nominal value, and therefore the pledge, of the coins themselves.[5]

[1] Foucault, *The Order of Things*, 182.
[2] Mary Poovey, *Genres of the Credit Economy: Mediating Value in Eighteenth- and Nineteenth-Century Britain* (Chicago: University of Chicago Press, 2008), 58.
[3] Smith, *The Wealth of Nations*, vol. 1, bk. 1 ch. 5, 44.
[4] Smith, *The Wealth of Nations*, vol. 1, bk. 2, ch. 2, 497-498.
[5] Thomas J Sargent and François R. Velde, *The Big Problem of Small Change* (Princeton, NJ: Prince-

But since paper money was not made of gold or silver or any other precious metal, that which guaranteed its pledge could not, like a coin, be the material from which it was made. That which assured paper money would be met with in exchange, therefore had to be external to it. This external guarantee could take three forms in the late eighteenth century.

1 Since it was metallic coins which had their pledge guaranteed by an intrinsic value, paper money could always be made convertible into a metallic currency on demand to the bearer of that note. Convertible paper notes, wrote Adam Smith, "come to have the same currency as gold and silver money from the confidence that such money can at any time be had for them".[1] What was essential here for the concept of the pledge, was not that paper money actually be converted into minted gold and silver coins; but, rather, that the guarantee of the pledge of paper money, as it circulated from hand to hand, was precisely the promise of its convertibility into a token with some kind of intrinsic value.

2 One of the ways in which paper money was issued into circulation in the eighteenth century was by means of making loans at banks. According to the accountant Thomas Smith this was the "legitimate foundation of banking, and the issuing of banknotes as a circulating medium".[2] In the eighteenth century, loans made to private bank customers primarily took the form of discounting bills of exchange and other promissory notes,[3] although the idea of issuing paper money on the security of land had been previously discussed throughout the seventeenth century.[4] A merchant or some other individual would take to a bank a written bill binding either himself or another to pay at a future date on the completion of some undertaking thought sufficiently likely to return a profit. The bill would be exchanged at the bank for a credit on an account which could be drawn on immediately in the form of the notes of that particular bank.[5] The

ton University Press, 2003); Christine Desan, *Making Money: Coin, Currency, and the Coming of Capitalism* (Oxford, UK: Oxford UP, 2014), ch. 3.

[1] Smith, *The Wealth of Nations*, vol.1, bk. 2, ch. 2, 434-435.

[2] Smith, *An Essay on the Theory of Money*, 52 and 68-70.

[3] Clapham, *The Bank of England: A History*, vol. 1, 122-129 and 204.

[4] J. Keith Horsefield, *British Monetary Experiments: 1650-1710* (Cambridge MA: Harvard UP), ch. 10; Foucault, *The Order of Things*, 82; Desan, *Making Money*, 367; Charlie Landale, "Land Bank Proposals 1650-1705", *The Student Economic Review* 26 (2012): 2-11.

[5] Smith, *The Wealth of Nations*, vol. 1, bk. 2, ch. 2, 444; Poovey, *Genres of the Credit Economy*, 36-42; Clapham, *The Bank of England: A History*, vol. 1, 208; "The 1783 Proposal of a Readymade Note",

bank would always pay less for the bill than what was paid back when it came due—hence the bill was said to be discounted. That which guaranteed the pledge of the issued notes was the future profitability of the debtor; that is, the reality that the bill would be paid back when it came due, returning the issued notes plus interest to their source.[1] As long as the bank discounted "real bills" drawn by "real creditors" upon "real debtors", then the pledge of the issued money was guaranteed by the future security that those discounted bills of exchange represented.[2]

3 In 1694 the Bank of England was established by parliament as a private stock company to lend funds to the government on demand and to manage the complex accounting of the government's national debt. The funds lent to the government were in the form of tax advances and made available the future revenue of taxes before they were collected. For this reason Adam Smith saw the Bank of England as "a great engine of state" which "advances to government the annual amount of the land and malt taxes, which are frequently not paid up till some years thereafter".[3] The accountant Thomas Smith explained that these anticipated funds were borrowed from the Bank in the form of the Bank of England's paper money, and "the Notes, thus paid away by government", would be "in due time, returned to the Bank in payment of these loans or taxes".[4] Such paper money was therefore loaned to government by the Bank to then be paid out to government creditors—such as public servants, contractors, national lottery winners etc.—thence, circulating from one person to the next, only to be paid back to the government in the form of taxes which were then used to either repay the loan that originated the issue at the Bank of England, or to pay the interest which had accumulated there on the borrowed paper money.[5] What

78-81.

[1] Smith, *An Essay on the Theory of Money*, 49-53.

[2] Smith, *The Wealth of Nations*, vol. 1, bk. 2, ch. 2, 428; this is the basis of the Real Bills Doctrine, see Roy Green, "Real Bills Doctrine", in *The New Palgrave Money*, edited by John Eatwell, Murray Milgate, and Peter Newman (New York: W. W. Norton, 1989), 310-313.

[3] Smith, *The Wealth of Nations*, vol. 1, bk. 2 ch. 2, 482.

[4] Smith, *An Essay on the Theory of Money*, 56; Batt, "The 1783 Proposal of a Readymade Note", 81-83.

[5] Smith, *An Essay on the Theory of Money*, 34; Smith, *The Wealth of Nations*, vol. 1, bk. 2, ch. 2, 497; Desan, *Making Money*, 311-332; Clapham, *The Bank of England: A History*, vol. 1, 149; Stefano Ugolini, *The Evolution of Central Banking: Theory and History* (London: Palgrave Macmillan UK, 2017), 174-175.

guaranteed paper money's pledge in this case was the government's ability to generate future revenue from its citizens, its promise to accept the Bank's paper money in payment of taxes, and its consequent ability to keep its debt to the Bank of England in check.

The three external options for guaranteeing the pledge of paper money listed above were not mutually exclusive, nor were all three of them simultaneously necessarily. Since many of the private banks which came to prominence in England in the eighteenth century could not directly lend their banknotes to government nor have them accepted as valid tax receipts, they could make use of only (1) and (2) to guarantee the pledge of their paper money. The Bank of England, however, being able to lend its notes to government and have them accepted as valid tax receipts, was able to make use of all three options to guarantee the pledge of its paper money (and this is, in a sense, why the Bank's paper money became *the* paper money of Britain). There is very little data to show the composition of the guarantees used by private banks in Britain; for the Bank of England, however, there is a wealth of data. In Figure 1, we can see that of the three options listed above the debt held by the Bank of England from the government (3) always made the largest share of its assets and therefore the most important guarantee of the pledge of its paper money, whereas both the precious metal commodities of gold and silver (1), and the expectation of private profits (2) hardly ever rose above 20 percent.

Regardless of the bank that originated the issue, each of the three guarantees of the pledge of paper money were conceived by Adam Smith and other late seventeenth-century monetary writers as limits of the amount of paper money in circulation. Such limits functioned by stipulating the legitimate uses which could be made of paper money, circumscribing its issuance as a productive social activity within the emerging capitalist economy—either as (1) a store of pre-existing commodity value to be converted on demand at a later date; (2) a representation of future private profits to be repaid with interest at a later date; (3) an anticipation of future public revenue to be repaid with interest at a later date. Put another way, the fact that paper money entered the world precisely because people wished to make use of it in one of three specific ways limited the amount of it that could be issued.

Drawing on the writings of Georges Bataille, I would like to call this view of the issuance of paper money a *restricted economy of notes*, since the pledge of

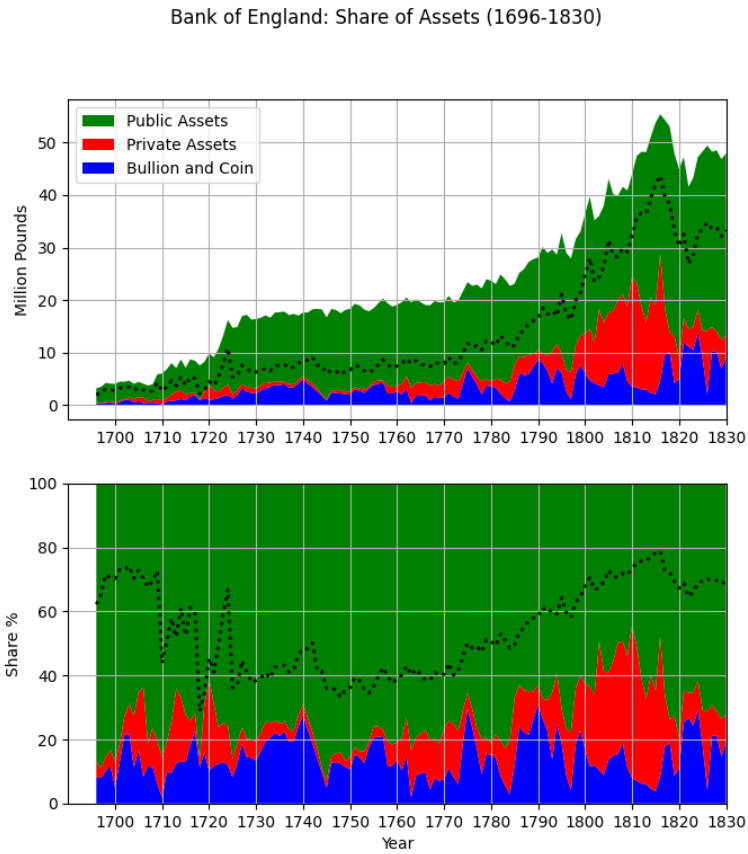

Figure 1: The share of different assets held by the Bank of England from 1696 to 1830. These assets guarantee of the pledge of both the Bank's paper money and the credit accounts used for cheque or draft payments (which appear as liabilities). There are three main assets held by the Bank: (1) Bullion and commodity coin; (2) Private assets, consisting of discounted bills of exchange and other loans; (3) Public assets, consisting of both permanent and short-term government debt. The dotted line represents the split between permanent (above) and short-term (below) government debt. Source: Author's own graph, based on data from "Bank of England Liabilities and Assets".

paper money "is conceived in terms of particular operations, (…) it *restricts* its object to operations carried out with a view to a limited end, that of economic man".[1] For Bataille, the limited ends of economic man take utility and usefulness as the fundamental principles with which to comprehend the world. What is of value to man is restricted to that which is *useful* to man.[2] In a restricted economy of notes, therefore, the issuance of paper money is restricted "to a resolution of the immediate difficulties [economic man] encounters", and can only be comprehended as something that he can *make use of*; what explains the issuance of paper money is its *utility*.[3]

It was thought, in the late eighteenth century, that a useful, well-functioning system of paper money had to be issued into circulation only when it was demanded for upon a well-defined credit—namely, the guarantee of its pledge—and would therefore always only ever come into existence with a corresponding debt that would ultimately be able to annihilate it when the two were brought together again, either when (1) it was exchanged with a formerly deposited quantity of precious metal; (2) repaid at the termination of a loan; (3) repaid as a tax payment to government. It was for this precise reason that Adam Smith thought that the operations of banks and their issuing of paper money above all,

> resemble a water-pond, from which, though a stream is continually running out, yet another is continually running in, fully equal to that which runs out; so that, without any further care or attention, the pond keeps always equally, or very near equally full.[4]

Similarly, for Jeremy Bentham, when paper money was properly issued it would be impossible to over issue and possessed,

> a sort of amphibious nature, in virtue of which, it will, of itself, and without any regulation (…) [either] be added to the mass of circulating medium, or withdrawn from it (…) as the circumstances of the time may happen to require.[5]

[1] Georges Bataille, *The Accursed Share: An Essay on General Economy*, trans. Robert Hurley (New York: Zone Books, 1991 [1949]), 22-23, emphasis my own.
[2] William Mitchell, Randall L. Wray, and Martin J. Watts. *Macroeconomics* (London: Macmillan International Higher Education, 2019), 3-5.
[3] Bataille, *The Accursed Share*, 21.
[4] Smith, *The Wealth of Nations*, vol. 1, bk. 2, ch. 2, 455.
[5] Bentham, "The True Alarm", 333-344, emphasis in original.

In the words of Michel Aglietta, this restricted economy of notes expresses what is known as the law of reflux: paper money—or credit more generally—issued under specific limiting conditions tends to flow back towards the issuer and is "destroyed in the reimbursement of the credit".[1]

5. A general economy of notes: i

The idea of a restricted economy is borrowed from Georges Bataille who uses it in *The Accursed Share* to signify a particular way of thinking in political economy in which "activity, considered as a whole, is conceived in terms of particular operations with limited ends".[2] Such a view of limited ends sees the primary task of economic activity as one of useful production within the constraints set by a restricted environment; it is the "minimum necessary for the conservation of life and the continuation of the individuals' productive activity in a given society".[3]

But, in general, the chemical, physical, and material processes that exist so abundantly in nature and which often serve as a basis for economically productive activity, do not exist to serve man's needs. Rather, it is the other way around. For Bataille we forget that "beyond our immediate ends, man's activity in fact pursues the useless and infinite fulfilment of the universe".[4] Even though

[1] Michel Aglietta, *Money: 5,000 Years of Debt and Power*, trans. David Broder (London: Verso, 2018 [2016]), 137.
[2] Bataille, *The Accursed Share*, 22.
[3] Georges Bataille, "The Notion of Expenditure", in *Visions of Excess: Selected Writings, 1927-1939*, ed. Allan Stoekl, trans. Allan Stoekl, Carl R. Lovitt, and Donald M. Jr. Leslie (Minneapolis, MN: University of Minnesota Press, 1985), 118.
[4] Bataille, *The Accursed Share*, 21.

it is the manifest utility of natural processes which is often seen as the justification for their employment, utility is not an ontological category which inheres within them. When we say that 'X is useful', we do not mean that there is a real property called 'use' that X possess independent of man. What we really mean is that 'X can be made use of', and it is then clear that usefulness is a category that is transferred onto X by a manifestly predispositional human culture. More importantly, the issue for Bataille is if it is ever possible to establish determinate ends, or final causes, for chemical, physical, and material processes when the universe is taken as a whole; for to describe something as useful presupposes an end which it fulfils. Yes, final causes are apparent in specific, restricted cases; but in general, no. For, the universe, even in its most proximate and remotest aspects, is "never anything but beyond thought". Its infinitude denotes its opposition to a definable end, and its fulfilment always designates the *fulfilment of itself* not *that which is fulfilled.*[1]

In this way, a restricted economy is contrasted with what Bataille sees as a more general view of economic activity in which the question is not how do we produce under conditions of scarcity; but rather, how do we organise our societies so as to expend excess resources.[2] This *general economy* has deep anthropological roots in humanity's past and predates the relatively recent restricted view which Bataille associates with the rise of political economy and utilitarianism in the eighteenth century. What is important for understanding human society, Bataille thinks, is not how we distribute scarce resources; but what humanity does with the *excess* and *waste* which necessarily goes beyond the immediate requirements for maintaining life. Such expenditure is the cause of human culture beyond just mere utility maximisation and can be anything from luxury, mourning, war, religion, monuments, games, spectacles, art, and sexual activity—all of which go well beyond the minimum needed for the continuation of life itself yet are essential to human society as it has come to be known.[3]

As such, we can look at chemical, physical and material processes from a restricted view and see something useful, fulfilling defined economic ends; or,

[1] Bataille, *The Accursed Share*, 21, fn. 1.
[2] Nigel Dodd, *The Social Life of Money* (Princeton, New Jersey: Princeton UP, 2014), 176.
[3] Bataille, "The Notion of Expenditure", 118.

looking at the same thing from the less restricted view of what Bataille calls *general economy*, we could see instead something which, in its own fulfilment of itself, has no definable end. Take fire as an example. It could be considered useful from the restricted view of economic man as it fulfils the task of cooking his meat on the primeval savannah. But in this case, as Gaston Bachelard wrote, usefulness is a state quite unrelated to the psychological conditions of man's prehistoric relations to fire, a primeval psychological state more aptly recognised as a potent mixture of fears, desires, dreams, and irrationalities.[1] Fire, considered independently from man's prehistoric psychological states, can be nothing but a complex manifestation of physical, chemical, and material phenomena with no definable end, existing only to play out the universe's fulfilment of itself.

Excess, for Bataille, is the manifestation of the universe's fulfilment of itself in contrast to the limited ends for which economic man would have it serve. *Waste* is the amount beyond which the universe's fulfilment of itself produces that economic man cannot find a use for. The sun which, for Bataille, "dispenses energy—wealth—without any return" has bathed its light onto the surface of the earth from time immemorial.[2] If this excess cannot all be used for the productive ends of economic man, at least part of it—*the accursed share*— "must necessarily be lost without profit, it must be spent, willingly or not, gloriously or catastrophically".[3]

I would like to contrast the *restricted economy of notes*, which I have described above, with a *general economy of notes*. The main purpose of introducing a general economy of notes into our discussion is to recognise the fact that there was an ambivalence inherent in the understanding of paper money in late seventeenth-century monetary writers, a fear of excessive issuance that cannot simply be reduced to the phenomenon of paper money's productive uses. After expounding the manifest benefit of paper money, the cautious Adam Smith warned his readers,

> The commerce and industry of the country, however, it must be acknowledged, though

[1] Gaston Bachelard, *The Psychoanalysis of Fire*, trans. Alan C. M. Ross (London: Routledge & Kegan Paul, 1944), 21-43.
[2] Bataille, *The Accursed Share*, 28.
[3] Bataille, *The Accursed Share*, 21; Bataille, "The Notion of Expenditure", 118.

they may be somewhat augmented, cannot be altogether so secure, when they are thus, as it were, suspended upon the Daedalian wings of paper money, as when they travel about upon the solid ground of gold and silver.[1]

Unlike a restricted economy of notes, a general economy of notes recognises in the increasing abundance of paper money not something which is necessarily the result of the limited ends which define the conditions under which it can or cannot be issued usefully; but, rather, an activity which must be seen more generally, an activity which, because it has yet to fully play out in its entirety, it is always open to contingent futures and always open to realising possible ends which may either be useful to economic man or catastrophic to all his dreams.

6. The virtual character of paper money

In 1801, Jeremy Bentham observed that the very idea that paper money was able bring a benefit to the industry and commerce of a nation seemed to be pervaded by an "air of paradox". For,

> to advance that paper money, *this counterfeit of money*, is productive of real wealth, that metallic money, *this substantial reality*, does not produce any, and that the only species of money which have the faculty of adding to real wealth are precisely the only ones which can lead to the catastrophe of bankruptcy—these are propositions which have a character of novelty for many readers and which appeared strange to myself. [2]

Jeremy Bentham's characterisation of paper money as that "counterfeit of money" contrasted with metallic money's "substantial reality", is a binary opposition that emphasised what many at the time saw as the inability of the pledge of paper money to be properly guaranteed. But, by associating this opposition with another binary opposition, namely, paper money's "productivity of real wealth" contrasted with the fact that metallic money "does not produce any", highlights the first feature of a general economy of notes, what I would like to call the *virtual character of paper money*.

[1] Smith, *The Wealth of Nations*, vol. 1, bk. 2, ch. 2, 484.
[2] Bentham, "The True Alarm", 68, emphasis my own.

Under the concept of the pledge, the logical progression that resulted in the emergence of paper money from minted gold and silver coins was based on the ability of paper money to disburden itself of the material commodity that formerly constituted the monetary sign. But, in doing so, the resulting productivity of paper money could then only be identified with a *lack*—the absence of any valuable material in the monetary sign itself. Associating the productivity of paper money with the absence of something, however, seemed to suggest to late seventeenth-century monetary thinkers that something could come from nothing.[1] Jeremy Bentham, however, did not think that something could come from nothing, "nothing can be made of nothing", he averred, "*ex nihilo nihil fit*".[2]

Such an absence, then, both empty yet simultaneously creative, became the source of an immaterial quality or virtue, explaining how something could come from nothing. Like that essential animating spirit which pervades all living matter, causing the barren earth to spring forth life eternal, the monetary sign of paper money, emptied of material wealth, was, at the same time, filled with an immaterial quality or virtue which caused it to be so productive of wealth while not itself containing anything of value. It is in this sense—an older, etymological sense of the word—that the monetary sign of paper money has a *virtual* character: for its excellence, potency, and efficacy seemed to appear in essence, not in fact.[3] And in the writings of Jeremy Bentham, it was precisely by claiming that paper money was *both* a counterfeit (void of material wealth) *and* productive of so much wealth that the expression of such virtuality comes into being.

We also find this double move in Adam Smith. In his account of the paper money issued by banks, he likened paper money to a great waggon-way through the air. Here, paper money was assigned the virtues which enabled it to transcend two mutually exclusive oppositions.

> The gold and silver money which circulates in any country may very properly be compared to a highway, which, while it circulates and carries to market all the grass and corn of the country, produces itself not a single pile of either. The judicious operations

[1] Brian Rotman, *Signifying Nothing* (London: Palgrave Macmillan UK, 1987), ch. 3.
[2] Bentham, "The True Alarm" 89.
[3] "Virtual, Adj. and n.", *OED Online*, Oxford UP, accessed August 16, 2022, `https://www.oed.com/view/Entry/223829`.

LAND / COMMODITIES:	ROAD / COINS:
LAND:	COMMODITIES:
productive / unnavigable	productive / unsaleable
ROAD:	COINS:
unproductive / navigable	unproductive / saleable

of banking, by providing, if I may be allowed so violent a metaphor, a sort of waggon-way through the air, enable the country to convert, as it were, a great part of its highways into good pastures and corn-fields, and thereby to increase very considerably the annual produce of land and labour.[1]

The first binary opposition is between land that is productive yet simultaneously unnavigable because it can grow crops yet no goods can be transported across it, and a road which is unproductive yet simultaneously navigable because it cannot grow any crops yet it can transport goods across it. This land/road opposition is mapped onto an opposition between commodities and coins. Thus, commodities are productive yet simultaneously unnavigable (unsalable), while coins are unproductive yet simultaneously navigable (saleable).

The important thing to recognise here is that each binary opposition is mutually exclusive. The ability to transport produce is, by its nature, excluded from the ability to be productive, for the road which is needed in order to transport goods is built on productive land, precluding the ability for that land to produce any goods itself. Similarly, the ability to act as a valid monetary sign—in the form of a coin—necessarily precludes the ability to grow and be productive, for to make coins grow it was necessary to charge interest.

The only way to transcend the binary opposition between land and road was to invoke what was at the time a purely imaginary notion. Rising up off the ground, the invocation of a waggon-way through the air allowed Adam Smith to imagine something that was able to transcend or overcome the formerly mutually exclusive pairing between land and road, making possible a new combination outside the binary opposition that was both productive and navigable at the same time.

[1] Smith, *The Wealth of Nations*, vol. 1, bk. 2, ch. 2, 484.

LAND / COMMODITIES:	ROAD / COINS:
WAGGON-WAY THROUGH THE AIR: productive/navigable	PAPER MONEY: productive/saleable

Paper money was for Adam Smith, simply the manifestation of this transcendence in the commodities/coin opposition. By seeing paper money as the transcendence of two mutually exclusive oppositions and describing it as *both* a valid monetary sign *and* capable of creating so much wealth, Adam Smith equated the absence at the heart of paper money with a productive, immaterial force, capable of generating a truly novel form of abstract monetary sign.

This was the case, because even though paper money and metallic coins were equivalent in terms of their respective pledges, they were radically different in how they guaranteed that pledge. Instead of being guaranteed by some form of prior wealth which would have centred the monetary sign and been immediately present to its holder, the three guarantees of paper money were always in essence deferring: either (1) a value to be converted on demand at a later date; (2) a representative of future private profits to be repaid at a later date; (3) an anticipation of future public revenue to be repaid at a later date. Although the guarantees of paper money's pledge were seen as limits, the abstract monetary sign in the form of paper money had seemingly lost its anteriority to something which had yet to come. As a result of the deferred values which necessarily had to guarantee its pledge, paper money had become a mere a sign, circulating with no referent, waiting—hopefully and patiently—for a value which might not ever come.

Emptied of the materiality that naturally limited metallic coins and provided its holders a material presence, the abstract monetary sign in the form of paper money was no longer seen to be naturally constrained in the same way; rather, because its constraints were always deferred, it was seen to be governed instead by the unit of account, that imaginary standard which had linked together so many different monetary signs under a single, common pledge. We are told by the writers of *A New and Complete Dictionary of Arts and Sciences* in 1763 that, "money is usually divided into real and imaginary. Real money includes

all coins whether of gold, silver, copper, or the like". Everything else, therefore, including paper money, was "imaginary money or money of account", and "is that which never existed, or, at least, which does not exist in real species".[1] For the accountant Thomas Smith, such an "ideal standard" which governed paper money in lieu of any intrinsic commodity content,

> appears to be something of the same nature with the letter placed for the unknown quantity in Algebra; it has no real value itself, but, by it, the relative value of all articles is fixed, all accounts are kept, and all exchange of property is settled.[2]

Thus, the virtuality which enabled Adam Smith and Jeremy Bentham to see paper money as a transcendence of mutually exclusive binary oppositions—that which gave it its "air of paradox"—was the effect of a kind of semiotic freedom which the monetary sign's loss of anteriority necessarily entailed. What Jacques Derrida has called the "free play" of signifiers within a structure which has lost all reference to a centre, a subject, or an origin was, for seventeenth-century monetary writers in England, the exact property of paper money which distinguished it from metallic coins and gave it its virtuality.[3]

For, even supposing the guarantee of paper money's pledge to be beyond doubt, Jeremy Bentham wrote, the value of paper money did not always equal its equivalent in metallic coins,

> under this supposition the value of the paper is *still greater* than that of the metal; the shadow is worth more than the substance. There are properties in the sign which are not found in the thing signified.[4]

It was not of course possible for the presence of metallic substance to explain paper money's virtual properties; but, for Jeremy Bentham, neither could the absent presence of that which was meant to replace the metallic substance, the deferred values which guaranteed the pledge of paper money. The shadow is

[1] "Money", in *A New and Complete Dictionary of Arts and Sciences Comprehending All the Branches of Useful Knowledge, with Accurate Descriptions as Well of the Various Machines, Instruments, Tools, Figures, and Schemes Necessary for Illustrating Them…* (London: 1763, s.n.), 2137.
[2] Smith, *An Essay on the Theory of Money*, 10-11.
[3] Jacques Derrida, "Structure Sign and Play in the Discourse of the Human Sciences", in *Writing and Difference*, trans. Alan Bass (Chicago: University of Chicago Press, 1978)", 278-279.
[4] Bentham, "The True Alarm", 94.

worth more than that from which it derives; and the sign has properties which its referent could never possess. The abstract monetary sign in the form of paper money here appears as a *supplement*, for "one cannot determine the centre and exhaust [its] totalisation, because the sign which replaces the centre, which supplements it, taking the centre's place in its absence—this sign is added, occurs as a surplus, as a supplement".[1] The properties, which Jeremy Bentham thought were all found in the sign and not in the thing that was being signified, were exactly those virtues and essences which were required in order to explain why paper money could, at the same time, be both a counterfeit of money and productive of so much real wealth.

7. A general economy of notes: ii

Adam Smith's comparison of paper money with a waggon-way through the air is, I believe, *the* instructive instance of a general economy of notes. For not only is the concept of virtuality the ground upon which paper money is understood to have emerged as a replacement for coined metal—paper money is the pure sign representing wealth in exchange whereas a coin doubles up—but such a virtuality contains within it the conditions for the possibility of paper money's unconstrained growth—if there were but one road through the air there is nothing in essence that appears to prevent two roads, three, or more from joining it. The element of general economy that will help us to draw out the second point is what Bataille describes as the "play of energy that no particular end limits", a "play of forces that runs counter to ordinary calculations".[2] This element of play is characterised by what Bataille calls *pressure* in a general economy, and

[1] Derrida, "Structure Sign and Play" 289.
[2] Bataille, *The Accursed Share*, 23 and 12.

we will see that it gives rise to two important notions in what I have called the general economy of notes: (1) technical extension; and (2) the enrichment of prices.

There are no accurate figures of the total amount of notes that were in circulation in Britain in the late eighteenth century. At the time, both the Bank of England and private banks closely guarded these figures, and speculation about the true amount was a commonplace topic in monetary writing at the time. Figure 2 shows the total number of Bank of England notes in circulation from 1696 to 1830. It illustrates the rapid growth which occurred in both the manufacture and issuance of paper money during the eighteenth century. The quantity of notes issued by private banks similarly increases over the same period. In 1700 there were no notes other than the Bank of England's; in 1750 there were approximately £1 million private bank notes; in 1790 there were £4 million; in 1870 there were £4.9 million.[1]

From the perspective of a general economy of notes, the growth experienced by all kinds of paper money in the late eighteenth century cannot simply be seen as a growth occurring to serve the ends of economic man, issued for the socially productive uses which it could serve; rather, it is a growth which must be seen more generally, a growth which has no necessarily defined end with respect to the interests of economic man. Such a growth is constantly threatening to overcome the limits which utility requires of it, and expresses the fact that for the limits of paper money's growth to be constraining, for the guarantee of paper money's pledge to be able to act as limits at all, there must be something there—with a definable pressure—pushing out against those limits; those limits, as it were, must be constraining something.

Bataille likens the pressure of general economy to the pressure exerted by organic life as it seeks to occupy all the available surfaces of the terrestrial sphere. "The most familiar example" he says "is that of a path that a gardener clears and maintains. Once abandoned the pressure of the surrounding life soon covers it over again with weeds and bushes swarming with life".[2] If the avail-

[1] Forrest Capie, "Money and Economic Development in Eighteenth-Century England", in *Exceptionalism and Industrialisation: Britain and Its European Rivals, 1688-1815* (Cambridge, UK: Cambridge UP, 2004), 225-227; Nuno Palma, "Money and Modernization in Early Modern England". *Financial History Review* 25, no. 3 (December 2018): 237.

[2] Bataille, *The Accursed Share*, 30.

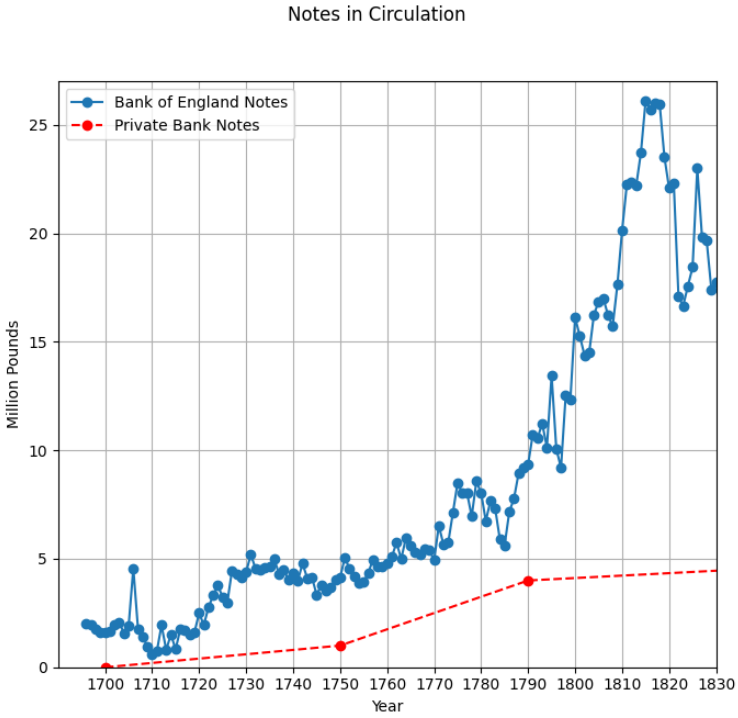

Figure 2: The value of the number of notes in circulation from 1696 to 1830 both BOE and private banks. Source: Bank of England Notes from "Bank of England Liabilities and Assets" and Private Bank Notes from Capie, "Money and Economic Development in Eighteenth-Century England".

able space were to constrain its growth, organic life would eventually come up against a boundary and, instead of converting the maximum of the available energy into growth, it "suffocates within limits that are too close" aspiring in "manifold ways to an impossible growth". If space becomes completely occupied and there is no outlet anywhere, the growth of organic life is encumbered by the limits of its surrounding environment and "without exploding, its extreme exuberance pours out in a movement always bordering on explosion".[1] In Bataille's conception of general economy, a system with more energy than it can convert into growth can respond to the existence of pressure in two ways. These Bataille calls the effects of pressure: the first is *extension*, and the second is *squander*.

(1) Extension works to extend the space within which a system can grow by either modifying itself or its environment. In the case of an organic system,

> The earth first opens to life the primary space of the waters and the surface of the ground. But life quickly takes possession of the air. To start with, it was important to enlarge the surface of the green substance of plants, which absorbs the radiant energy of light. The superposition of leaves in the air extends the volume of this substance considerably.[2]

Here it is the ability to transcend or overcome the constraints set by an environment that maintains the growth of organic systems. Through a physical transformation, new possibilities of growth are opened up. Similarly, Bataille gives the example of an immense crowd gathered to watch a bullfight for which the stadium is too small.[3] "The crowd wants badly to enter but cannot be entirely accommodated: Many people must wait outside". The first effect of pressure, says Bataille, is to increase the number of seats in the stadium. This extension of the available space is mirrored outside the stadium as well since "there may be trees and lampposts from the top of which the arena is visible", and by climbing these trees and lampposts people will see into the stadium. Each of these effects of pressure modifies the system so as to increase its growth by redefining the conditions which set the maximum allowed for viewing the stadium. Each time a new way is found to allow for an even greater number to view the inside

[1] Bataille, *The Accursed Share*, 30.
[2] Bataille, *The Accursed Share*, 31-32.
[3] Bataille, *The Accursed Share*, 31-32.

stadium. This is not a process of maximisation in the classical utilitarian sense. Rather, extension is a process that alters the constraints within which maximisation processes are allowed to occur, making possible new configurations and new maxima which were not previously possible.

For Bataille, the most important form of extension is given by human labour which by "transforming the world, augments the mass of living matter with supplementary apparatuses, composed of an immense quantity of inert matter".[1] In a general economy, that which allows the "play of energy that no particular end limits", to in fact be able to play itself out and not become restricted is the result of a physical transformation, for it is human technical activity which has "in short made it possible to extend—to develop—the elementary movement of growth that life realises within the limits of the possible".[2] No doubt, the vast, unfathomable growth in the techniques of industrial production throughout the eighteenth century and the commodities which these same techniques gave rise to are an example of this. All those new things, undreamt of before, are now objects which more money than ever before can buy. But, more important than this, for us it is Adam Smith's description of paper money itself as a waggonway through the air that is precisely the kind of extension, the overcoming of the constraints imposed by its environment, which Bataille describes here. Within the perspective of a general economy of notes, what I have called the virtual character of paper money, which we saw earlier as an effect of the the free play of monetary signifiers, is simultaneously a technical effect, an effect of *techne*—what Aristotle said was concerned with "coming into being" or "revealing" through the capacity to make as opposed to "being" merely through necessity or in accordance with a nature.[3] By lifting the industry and commerce of a nation up out of the labyrinth of commodity coin on the *Daedalian* wings of paper the modification in the materiality of the monetary sign is effected by a *technical* transformation. Indeed, those Daedalian wings which lift the waggonway up into the air, those wings are made by Daedalus—that master craftsman of technical skill and strategy—he who was inventor of contraptions, tools, and

[1] Bataille, *The Accursed Share*, 36.

[2] Bataille, *The Accursed Share*, 36.

[3] W.D. Ross, trans. "Aristotle's Nicomachean Ethics", MIT Classics, 1994, `http://classics.mit.edu/Aristotle/nicomachaen.html`: VI:4.

labyrinths; statues that seemed to be alive, and prosthetics which altered mortal humans.[1]

The importance of technical activity for paper money's virtuality is that it draws attention to the means by which mutually exclusive binary oppositions are overcome though the generation of something novel and unexpected, fundamentally different to what was there before.[2] This form of generation is the essential expression of paper money's virtuality and is the cause of the outward pressure in a general economy of notes—a pressure that cannot be explained by the 'supply side' alone. Being a technical effect, paper money's virtuality is revealed through the manifold action of a range of new objects, tools, practices, and techniques introduced into British society in the seventeenth century, like mould making, paper making, copper-plate engraving, industrial mechanisation, and the mechanical exteriorisation of human labour as applied to the making of paper money itself.[3]

All these effects altered the technical production of paper money and gave rise to its virtuality. To understand the means by which paper money's virtuality and growth are brought about, to understand the free play of monetary signifiers, it would be necessary therefore to understand its essential technical nature, its *technicity*.[4]

[1] Bruno Latour, "On Technical Mediation", *Common Knowledge* 3, no. 2 (1994), 29-30.

[2] Astrid Schwarz, *Experiments in Practice* (London: Routledge, 2015), 173-188; Martin Carrier and Alfred Nordmann, "The Political Economy of Technoscience", in *Science in the Context of Application* (Dordrecht: Springer, 2011), 317-336.

[3] Bernard Stiegler, "Memory", in *Critical Terms for Media Studies*, ed. W.J.T. Mitchell and Mark B.N. Hansen (Chicago: The University of Chicago Press, 2010), 64-87. For technical change in the late eighteenth century: David Kynaston, *Till Time's Last Sand: A History of the Bank of England, 1694-2013* (London: Bloomsbury Publishing, 2017), 59-76 and 98-104; Anne L. Murphy, "Inspection and Efficiency at the Eighteenth-Century Bank of England", *Histoire & Mesure* 30, no. 2 (December 30, 2015): 147-170; Anne L. Murphy, "The Bank of England and the Genesis of Modern Management", *The European Association for Banking and Financial History*, no. 16-02 (2016): 34; Mackenzie, *The Bank of England Note*, 1-60; Virginia Hewitt and J.M. Keyworth, *As Good as Gold* (London: Trustees of the British Museum in association with the Bank of England, 1987), ch. 1 and 2; Jonathan H. Grossman, "Passing Cash from Bank Notes to Bitcoin: Standardizing Money", *Journal of Cultural Economy* 12, no. 4 (July 4, 2019), 300-306; David M. Batt, "Depoliticisation, Technical Discourse, and Paper-Money: A Case Study in the Bank Restriction Period". *Journal of Cultural Economy* 14, no. 2 (2021), 228-233.

[4] Bernard Stiegler, *Technics and Time*, 1:17.

(2) Squander, on the other hand, expresses what happens when a system can no longer continue to sufficiently alter itself or its environment so as to continue growing. The question of what it does with its excess becomes what it does with its waste. Since the system can no longer grow through extension or technical change, a part of the growing system is destroyed or annihilated so that it may *regrow* that which was lost. In this way, the system manages to increase its consumption of the available energy while remaining within constraints which cannot be changed. Bataille gives the example of death in organic systems as an example of squander. Once an organism like duckweed reaches the "narrowly determined limits of a pond", the continuation of growth is only possible if some of its members die or are destroyed.[1] Thus, if life were immortal, says Bataille, it would quickly populate the earth taking up all available space, and further growth would become impossible for lack of room. In this way "living matter continually makes available to growth the place left vacant by death".[2] What is important here is that the continuous growth of a system, its indefatigable expenditure of energy and resources, can only be maintained by destroying a part of itself, clearing a pre-existing space, and then filling in that space again.

For a general economy of notes, squander illustrates the fact that not all of paper money's growth occurs as a result of extension or technical change. Central to paper money's growth is an essential act of destruction. Once the abstract monetary sign of paper money has grown to the greatest extent possible defined by the limits which constitute its useful issuance, and if technical extension can no longer occur or cannot occur rapidly enough, a further increase in the quantity of monetary signs can become possible only by a preceding increase in the nominal prices of the goods and services which that money can buy. This is because when the prices of goods and services increase, a nominal or discursive space is opened up in the economy that was not there before. That is, a gap emerges between the x units of currency which formerly bought all goods and services priced at x units and the x units which now are available to buy those same goods and services priced at $x + \Delta x$. This gap can be filled by issuing exactly Δx units of currency beyond what was already there before. An increase in the prices of goods and services—the unnecessary waste of paying more for

[1] Bataille, *The Accursed Share*, 31-32.
[2] Bataille, *The Accursed Share*, 32.

something which formerly required less—will then be the only way to ensure that the quantity of monetary signs in circulation will continue to increase even when all money has been usefully employed and technical extension no longer operates. We could say, perhaps, that the abstract monetary sign continually makes available to growth the place left vacant by rising prices. When it happens slowly, over a long period of time, the process of squander in the domain of a general economy of notes is represented economically as the phenomenon of long-term secular inflation, a general rise in the price of goods and services; when it happens suddenly and without warning, it is represented by recession and economic crisis.[1]

In both these cases, what it is important for us to understand, is that, from the perspective of a general economy of notes, unlike the restricted economy of notes, there is no problem for the abstract monetary sign when it is in excess. What is true of the abstract monetary sign is that, from the perspective of a general economy of notes, there is no problem for the abstract monetary sign when it exists in excess.[2]

8. A fear of excess

British monetary thinkers of the eighteenth century did not perceive the increasing quantity of money in their society as a phenomenon of either extension or squander in the way I have described them. In the restricted economy of late eighteenth-century monetary discourse, the two were combined together into a single fear of excess.

By the time of Adam Smith, the view that the quantity of a particular currency in circulation and the speed of its circulation was in an inverse proportion to the value of that currency had had a long history going back to Copernicus, Bodin, Locke, and Hume.[3] When these pre-nineteenth-century authors were

[1] Mitchell, Wray, and Watts, *Macroeconomics*, 245-267; David Harvey, *The Limits to Capital* (London: Verso, 2006), 307-315.

[2] Jon Roffe, *Abstract Market Theory*, (Houndmills, Basingstoke Hampshire; New York: Palgrave Macmillan, 2015), 2.

[3] Foucault, *The Order of Things*, 199; Oliver Volckart, "Early Beginnings of the Quantity Theory of Money and Their Context in Polish and Prussian Monetary Policies, c. 1520-1550", *The Economic*

writing, however, because paper money had yet to attain the wide-spread use which it obtained in late eighteenth- and early nineteenth-century Britain, such a concept was almost always only ever discussed in relation to gold and silver coins. But money in the late eighteenth century had been dramatically transformed from what it had been a little over a century prior. It had transformed from something that was created solely by the state in the form of gold and silver coins at the Royal Mint, to something whose creation was shared with the issuance of paper money by numerous banks.[1] In 1748 Benjamin Franklin had reminded his readers that in the case of metallic coins,

> money is of a prolific generating Nature. Money can beget Money, and its Offspring can beget more, and so on. Five Shillings turn'd, is Six: Turn'd again, 'tis Seven and Three Pence; and so on 'til it becomes an Hundred Pound. The more there is of it, the more it produces every Turning, so that the Profits rise quicker and quicker.[2]

Franklin argued that metallic coins would increase in this way only in the case when they were lent out, profitably invested, and had interest charged upon them. If such coins were left idle, however, and not lent out, they would instead remain dormant and not grow at all. Coined metal, it seemed to Franklin, did not always have the same prolific generating nature as when it was lent out at interest.

But unlike metallic coin—which contained its guarantee intrinsically—paper money obtained its guarantee through something external to it, and came into existence always through an act of lending which, by design, required more of it be paid back than was originally lent—either in the form of (1) the interest paid by a bank on a quantity of deposited precious metal, (2) the interest paid by a customer on a discounted bill, (3) the interest paid by the state in the form of tax revenue on the national debt. Regardless of wherever such paper money ultimately ended up as a result of its circulation, regardless of whether it was kept idle or invested into the most advantageous schemes on offer, such paper

History Review 50, no. 3 (1997): 430-449; Denis P. O'Brien, "Bodin's Analysis of Inflation", *History of Political Economy* 32, no. 2 (June 1, 2000): 267-292; Mark Blaug, ed., *The Quantity Theory of Money: From Locke to Keynes and Friedman* (Aldershot, Hants, UK: Edward Elgar, 1995).

[1] Desan, *Making Money*, 11-21.

[2] Benjamin Franklin, "Advice to a Young Tradesman", in *The American Instructor: Or Young Man's Best Companion*, ed. George Fisher, 9th ed. (Philadelphia: B. Franklin and D. Hall, 1748), 375.

money's *pudenda origo*—the origin of the guarantee of its pledge—was always an act of lending which ultimately needed to be paid back either to the depositor or the banks which issued it. Unlike Benjamin Franklin's discussion of metallic coins, in the case of paper money, even if left idle after being paid away, there would always be interest accumulating somewhere as a result of its existence, forcing either the bearer or the issuer to seek out productive investments so as to pay the interest back. In this way, Adam Smith wrote, paper money was liable to many "accidents", from which "no prudence or skill" could guard them. "A Prince",

> anxious to maintain his dominions at all times in the state in which he can most easily defend them, ought (…) to guard, not only against that excessive multiplication of paper money which ruins the very banks which issue it; but even against that multiplication of it, which enables them to fill the greater part of the circulation of the country with it.[1]

The fear that was understood at the time as a *depreciation* in the value of the British pound was precisely the fear of being glutted by such an excess of paper money. A fear that because there was nothing which could limit its issuance and nothing which could stop its growth the entire national currency was constantly under the threat of suffering a depreciation in its value. It is important to understand that it was not the issuing of just any type of money that might cause depreciation, but specifically the abstract monetary sign in the form of paper money issued by all banks operating in Britain.[2] For Thomas Paine in 1796, the consequence of a system of issuing a *paper* currency in contrast to *metallic* coins was that the "quantity [becomes] so enormous, and so disproportioned to the quantity of population, and to the quantity of objects upon which it could be employed, that the market, if I may so express it [is] glutted with it".[3] Paine continued

> Do we not see that nature, in all her operations, disowns the visionary basis upon which the funding system is built? She acts always by renewed successions, and never by ac-

[1] Smith, *The Wealth of Nations*, vol. 1, bk. 2, ch. 2, 485.
[2] Michael F. Bryan, "On the Origin and Evolution of the Word Inflation", in *Handbook of Monetary Policy*, ed. Jack Rabin and Glenn L. Stevens (New York: Marcel Dekker, 2002) , 593-599.
[3] Thomas Paine, *The Decline and Fall of the English System of Finance* (Paris: Hartly, Adlard and son, 1796), 3.

cumulating additions perpetually progressing … He [the banker] has conceived that art can do what nature cannot.[1]

Similarly, Jeremy Bentham would write that "The augmentation of the means of circulation" and the "multiplication of paper" were all responsible for an increase in prices, and a depreciation of money's value; for,

> the value of money is at present (in 1801) only half of what it was forty years ago: in forty years it will only be half of what it is at present. (…) Money, always money, abundance and multiplication of money, such has been the universal cry of nations, and the public vote has guided the councils of the princes. (…) It is in the unlimited issue of paper money and money in general that the evil lies.[2]

The fear of the depreciation of the value of money brought about by its excessive issuance was thus the result of the two effects of pressure in a general economy of notes discussed above—the expansion of the quantity and virtuality of the monetary sign through technical extension and the rising of prices through squander. But instead of separating these two effects, late eighteenth-century monetary writers combined them together into a single fear of excess.

For these writers, paper money was beneficial to the operations of commerce and industry precisely because of its ability to transcend the stolid materiality of commodity coin through a process to technical extension. This was precisely what Adam Smith implied by evoking Daedalus in his account of paper money and what Paine meant when he wrote that the banker had "conceived that art can do what nature cannot". But the consequence that this technical extension brough about was a kind of virtuality which meant that, if the prudent limitations of a restricted economic legislator were eschewed, there was nothing in principle which could limit its issuance, nothing which could stop its growth. Although the issuance of paper money was understood to be limited by the guarantee of its pledge, it was the virtual character of paper money—its ability to transcend the stolid materiality of commodity coin and embody the essential property of money as a measure and bearer of abstract value—that meant that paper money was always capable of expanding beyond its useful limits, aspiring in manifold ways to a continuous growth.

[1] Paine, *The Decline and Fall of the English System of Finance*, 27-28.
[2] Bentham, "The True Alarm", 53-70.

9. Conclusion

What my discussion above has shown is that even in the late eighteenth century, at the dawn of the age of paper money in the world of capitalism, the very idea that paper money rested on tentative foundations, always bordering on the potential for excess, was directly linked to its existence as a beneficial replacement for coined metal. For eighteenth-century monetary writers, paper money was beneficial to the operations of commerce and industry precisely because of what I have called the virtual character of paper money: money's ability to represent value in exchange without itself containing any intrinsic value. Unlike a minted gold or silver coin whose representative ability was duplicated at least in part by its intrinsic, material value, paper money was understood to be a pure, representative sign, signifying its referent in an arbitrary manner solely by the written signs and material traces impressed upon its surface. But superimposed upon the good that paper money might bring was a corresponding potential for excess. Unencumbered by the materiality of commodity coin and issued into circulation on the anticipation of future profits, paper money was always threatening to increase, "without exploding, its extreme exuberance pours out in a movement always bordering on explosion".[1]

In this sense, paper money's virtuality is what Jacques Derrida has called a *pharmakon*. "This 'medicine', this philtre, which acts as both remedy and poison, already introduces itself into the body of the discourse with all its ambivalence".[2] Paper money's ability to represent wealth in exchange while at the same time not containing any was understood in the late eighteenth century

[1] Bataille, *The Accursed Share*, 30-31.

[2] Jacques Derrida, "Plato's Pharmacy", In *Dissemination*, trans. Barbara Johnson (London: The Athlone Press, 1983), 75.

as a *cure* for the inconveniences of commodity coin, but could just as easily appear as the *poison* which epitomised the destruction of value through overissue. The benefit of paper money as a replacement of minted gold and silver coins along with the potential for its excessive issuance were both, as it were, two sides of the same coin in eighteenth-century monetary discourse, a fact that is strikingly illustrated by Bataille's notion of a general economy.

The contrast between a general economy of notes and a restricted economy of notes shows us a third feature that the virtuality of paper money has as a *pharmakon*: its role as a scapegoat.[1] By insisting that the quantity of money in circulation and the speed of its circulation both had an inverse relationship with the value of money, as writers like Locke and Hume had done over the past hundred years, late-eighteenth century monetary writers in Britain inherited a tradition that necessarily identified the virtuality of the abstract monetary sign with a depreciation in the value of a national currency. And since, when the value of a currency decreases, prices expressed in that currency necessarily increase, the virtuality of the abstract monetary sign became synonymous both with the deprecation of the national currency and the exorbitant rising of prices. In a restricted economy of notes rising prices were thus conceived of as an effect of devaluation, and that devaluation was implicitly understood as an effect of paper money's virtuality.

For late eighteenth-century writers, therefore, the beneficial characteristics of the abstract monetary sign gave rise to a fear of excess, a fear that in essence there was nothing which could limit its issuance, nothing which could stop its growth. It was specifically because of this fear of excess that a restricted economy of notes was so important in the discourse of late eighteenth-century monetary writers like Adam Smith. Because of its virtual character, paper money could never be too scarce; in other words, it was never a problem for Adam Smith that paper money could not be produced in large enough quantities, the problem was always one of limiting its natural excessiveness, restricting its issuance in terms of the utility that it had to bring to economic man.

It is this fear of excess, which is the logical endpoint of a restricted economy of notes, that I believe illustrates the fact that the virtuality of money had become a scapegoat. When faced with the growth of the abstract monetary sign

[1] Derrida, "Plato's Pharmacy", 130.

and the seemingly supernatural properties often given to it to exist in abundance, it is easy to point to virtuality as something which has swooped down from above and corrupted the monetary sign from within. It seems then that the virtual character of paper money is a Faustian pact which, in obtaining the impossible multiplication of riches, has in fact hollowed out the essential core of money's value.[1] Such a conception decries paper money's virtuality as a kind of selling out of the soul of money, either as the expediency to political autocracy and the encroachment of state control over individual liberties (as in the critique of paper money and credit by 'sound money' proponents like Von Mises) or an effect of the increasing rationalisation and disenchantment of contemporary culture by a mass produced capitalist industry (as in the critique of money common in Marxist circles or those of the Frankfurt School).

Of course, as a *pharmakon*, the virtuality of paper money is capable of both being a cure and a poison. But the nature of a *pharmakon* as a scapegoat comes to the surface precisely when certain negative effects are exploited or exaggerated, and its positive effects are no longer capable of being seen as a potential cure.

> Both poison and remedy, the *pharmakon* can also become the scapegoat of the negligent, who do not know how to make a cure of it and who let it imprison the life of the indifferent, that is to say, those who do not know how to live pharmaco-logically.[2]

Under the fear of excess, therefore, the virtuality of the abstract monetary sign becomes imbued with a misunderstanding similar to the notion of waste and excess in a restricted economy. In a restricted economy of notes, it is forgotten that the continuous growth of the abstract monetary sign is not something outside of it, it is not something paradoxical or contradictory whose inexplicability needs to be disentangled. What remains true for the abstract monetary sign is that even when it is in excess, it still continues to function exactly how it should.

Perhaps, then, Adam Smith's invocation of that master craftsman Daedalus as the eponym of paper money, is the best expression of the profound ambiva-

[1] Hans Christoph Binswanger, *Money and Magic: A Critique of the Modern Economy in Light of Goethe's Faust* (Chicago: University of Chicago Press, 1994).

[2] "Pharmakon (Pharmacologie)", in *Ars Industrialis*, accessed August 16, 2022, `https://arsindustrialis.org/pharmakon`, *translation my own.*

lence in late eighteenth-century monetary thought surrounding paper money.[1] Like the waxen wings of Daedalus, manufactured to save him and his son Icarus from an impossible labyrinth; the "Daedalian wings of paper money" too were an object of technical ingenuity, suspending industry and commerce above the ground, lifting them up out of their imprisonment within the labyrinth of commodity coin. Just as Daedalus anxiously shouted out to his son Icarus, whom he saw was overcome by the joy of soaring freely through the air and desiring to fly higher and higher, closer and closer to the sun; there was a profound fear in eighteenth-century monetary thought that paper money too might be driven to greater and greater heights, depreciating the value of the currency. And so, even though those wings were the cause of a great escape, and even though Daedalus knew that it was not his inventions that had killed his son, the guilt that Daedalus suffered and the blame that was attributed to him and his waxen wings were most certainly scapegoats for the hubris that Icarus himself had harboured in those moments when he was mistaken for a god by the ploughmen below and came crashing down towards his death.

> … Now Icarus falls down head first
> the last frame of him is a glimpse of a heel childlike small
> being swallowed by the devouring sea
> Up above the father cries out the name
> which no longer belongs to a neck or a head
> but only to a remembrance …[2]

Bibliography

Aglietta, Michel. *Money: 5,000 Years of Debt and Power*. Translated by David Broder. London: Verso, 2018 [2016].

Bachelard, Gaston. *The Psychoanalysis of Fire*. Translated by Alan C. M. Ross. London: Routledge & Kegan Paul, 1944.

[1] March, "Icarus", 415.

[2] Zbigniew Herbert, "Daedalus and Icarus", trans. Marek Lugowski, *Xconnect* 4, no. 2 (1998) (typo: 'heal' corrected to 'heel').

Bataille, Georges. *The Accursed Share: An Essay on General Economy*. Translated by Robert Hurley. New York, NY: Zone Books, 1991 [1949].

——. "The Notion of Expenditure". In *Visions of Excess: Selected Writings, 1927-1939*, edited by Allan Stoekl, translated by Allan Stoekl, Carl R. Lovitt, and Donald M. Jr. Leslie, 116-29. Minneapolis, MN: University of Minnesota Press, 1985.

Batt, David M. "Depoliticisation, Technical Discourse, and Paper-Money: A Case Study in the Bank Restriction Period". *Journal of Cultural Economy* 14, no. 2 (2021): 225-239.

——. "The 1783 Proposal for a Readymade Note at the Bank of England". *Financial History Review* 29, no. 1 (April 2022): 72-97.

Bentham, Jeremy. "The True Alarm: A View of Paper Money, Its Good Effects, Bad Effects, and Their Remedies, and Its Connection with Real Wealth (1801)". In *Jeremy Bentham's Economic Writings: Critical Edition Based on His Printed Works and Unprinted Manuscripts*, edited by W. Stark, vol. 3, 61-216. London: George Allen & Unwin, 1952 [1801].

Binswanger, Hans Christoph. *Money and Magic: A Critique of the Modern Economy in Light of Goethe's Faust*. Chicago: University of Chicago Press, 1994.

Blaug, Mark, ed. *The Quantity Theory of Money: From Locke to Keynes and Friedman*. Aldershot, Hants, UK: Edward Elgar, 1995.

Bryan, Michael F. "On the Origin and Evolution of the Word Inflation". In *Handbook of Monetary Policy*, edited by Jack Rabin and Glenn L. Stevens, 593-599. New York: Marcel Dekker, 2002.

Capie, Forrest. "Money and Economic Development in Eighteenth-Century England". In *Exceptionalism and Industrialisation: Britain and Its European Rivals, 1688-1815*, 216-232. Cambridge, UK: Cambridge UP, 2004.

Carrier, Martin, and Alfred Nordmann, eds. "The Political Economy of Technoscience". In *Science in the Context of Application*, 317-36. Boston Studies in the Philosophy of Science. Dordrecht: Springer, 2011.

Clapham, John. *The Bank of England: A History*. 2 vols. Cambridge, UK: The University of Cambridge Press, 1945.

Derrida, Jacques. "Plato's Pharmacy". In *Dissemination*, translated by Barbara Johnson, 61-171. London: The Athlone Press, 1983.

——. "Structure Sign and Play in the Discourse of the Human Sciences". In *Writing and Difference*, translated by Alan Bass, 278-294. Chicago: University of Chicago Press, 1978.

Desan, Christine. *Making Money: Coin, Currency, and the Coming of Capitalism*. Oxford, UK: Oxford UP, 2014.

Dodd, Nigel. *The Social Life of Money*. Princeton, New Jersey: Princeton UP, 2014.

Feavearyear, Albert Edgar. *The Pound Sterling: A History of English Money*. 2nd ed. Oxford, UK: Oxford UP, 1963 [1931].

Foucault, Michel. *The Order of Things: An Archaeology of the Human Sciences*. New York: Vintage Books, 1994.

Franklin, Benjamin. "Advice to a Young Tradesman". In *The American Instructor: Or Young Man's Best Companion*, edited by George Fisher, 9th ed., 375-377. Philadelphia: B. Franklin and D. Hall, 1748.

Green, Roy. "Real Bills Doctrine". In *The New Palgrave Money*, edited by John Eatwell, Murray Milgate, and Peter Newman, 310-13. New York, NY: W. W. Norton, 1989.

Grossman, Jonathan H. "Passing Cash from Bank Notes to Bitcoin: Standardizing Money". *Journal of Cultural Economy* 12, no. 4 (July 4, 2019): 299-316.

Harris, Joseph. *An Essay upon Money and Coins Part I: The Theories of Commerce, Money and Exchange*. London: G. Hawkins 1757.

Harvey, David. *The Limits to Capital*. London: Verso, 2006.

Herbert, Zbigniew. "Daedalus and Icarus". Translated by Marek Lugowski. *Xconnect* 4, no. 2 (1998).

Hewitt, Virginia, and J.M. Keyworth. *As Good as Gold: 300 Years of British Bank Note Design*. London: Trustees of the British Museum in association with the Bank of England, 1987.

Horsefield, J. Keith. *British Monetary Experiments: 1650-1710*. Cambridge MA: Harvard University Press, 1960.

—. "The Beginnings of Paper Money in England". *Journal of European Economic History* 6, no. 1 (1977): 117-32.

Ingham, Geoffrey K. *The Nature of Money*. Cambridge, UK: Polity, 2004.

Kynaston, David. *Till Time's Last Sand: A History of the Bank of England, 1694-2013*. London: Bloomsbury Publishing, 2017.

Landale, Charlie. "Land Bank Proposals 1650-1705". *The Student Economic Review* 26 (2012): 2-11.

Latour, Bruno. "On Technical Mediation". *Common Knowledge* 3, no. 2 (1994): 29-64.

Locke, John. *Two Treatises of Government*. London: Printed for C. and J. Rivington *et al.*, 1824 [1690].

Mackenzie, A. D. *The Bank of England Note: A History of Its Printing*. Cambridge, UK: Cambridge UP, 1953.

March, Jennifer R. "Icarus". In *Cassell's Dictionary of Classical Mythology*, 414-16. London: Cassell & Co., 2001.

Mitchell, William, Randall L. Wray, and Martin J. Watts. *Macroeconomics*. London: Macmillan International Higher Education, 2019.

"Money". In *A New and Complete Dictionary of Arts and Sciences: Comprehending All the Branches of Useful Knowledge, with Accurate Descriptions as Well of the Various Machines, Instruments, Tools, Figures, and Schemes Necessary for Illustrating Them*, 3: 2137. London: 1763, s.n.

Murphy, Anne L. "Inspection and Efficiency at the Eighteenth-Century Bank of England". *Histoire & Mesure* 30, no. 2 (December 30, 2015): 147-70.

—. "The Bank of England and the Genesis of Modern Management". *The European Association for Banking and Financial History*, no. 16-02 (2016): 34.

O'Brien, Denis P. "Bodin's Analysis of Inflation". *History of Political Economy* 32, no. 2 (June 1, 2000): 267-292.

Paine, Thomas. *The Decline and Fall of the English System of Finance*. Paris: Hartly, Adlard and son, 1796.

Palma, Nuno. "Money and Modernization in Early Modern England". *Financial History Review* 25, no. 3 (December 2018): 231-261.

"Pharmakon (Pharmacologie)". In *Ars Industrialis*. Accessed August 16, 2022. https://arsindustrialis.org/pharmakon.

Poovey, Mary. *Genres of the Credit Economy: Mediating Value in Eighteenth- and Nineteenth-Century Britain*. Chicago: University of Chicago Press, 2008.

Roffe, Jon. *Abstract Market Theory*. Houndmills, Basingstoke Hampshire; New York: Palgrave Macmillan, 2015.

Ross, W.D., trans. "Aristotle's Nicomachean Ethics". MIT Classics, 1994. http://classics.mit.edu/Aristotle/nicomachaen.html.

Rotman, Brian. *Signifying Nothing*. London: Palgrave Macmillan UK, 1987.

Sargent, Thomas J., and François R. Velde. *The Big Problem of Small Change*. Princeton, NJ: Princeton UP, 2003.

Schwarz, Astrid. *Experiments in Practice*. London: Routledge, 2015.

Smith, Adam. *An Inquiry into the Nature and Causes of the Wealth of Nations*. 3 vols. London: Alex Murray & Son, 1812 [1776].

Smith, Thomas. *An Essay on the Theory of Money and Exchange*. 1thst ed. London: T. Cadell and W. Davies, 1807.

Stiegler, Bernard. "Memory". In *Critical Terms for Media Studies*, edited by W.J.T. Mitchell and Mark B.N. Hansen, 64-87. Chicago: The University of Chicago Press, 2010.

—. *Technics and Time: The Fault of Epimetheus*. Vol. 1. Stanford, CA: Stanford UP, 1998.

Ugolini, Stefano. *The Evolution of Central Banking: Theory and History*. London: Palgrave Macmillan UK, 2017.

"Virtual, Adj. and n". In *OED Online*. Oxford UP. Accessed August 16, 2022. https://www.oed.com/view/Entry/223829.

Volckart, Oliver. "Early Beginnings of the Quantity Theory of Money and Their Context in Polish and Prussian Monetary Policies, c. 1520-1550". *The Economic History Review* 50, no. 3 (1997): 430-449.

"Chi n'ha ne semina". Coloured etching after Giuseppe Piattoli (?), c. 1800. Public Domain (Wellcome Trust 17942i, https://wellcomecollection.org/works/wcdq57ha).