OTHER PEOPLE'S MONEY

It was never a secret. It was explained by Walter Bagehot in 1883: bankers do not get rich using their own money; they get rich using other people's money. Bankers lend the money deposited with them to other people; or they buy and sell claims to commodities, shares of stock, bonds, and so forth. What is peculiar about all financial transactions is that everyone expects to get back at least as much as they have put out and then some. Depositors expect to get their money back from the bank; the bank expects loans to be repaid and to gain as much from the sale of stocks and bonds as they paid. And then some.

I think we should be as surprised that this is usually the case as we are clearly surprised when it doesn't happen, when deposits are lost, loans are not repaid, and money is lost investing in stocks and bonds. Some bankers get rich; others do not. Banks can and do fail, and a bank failure can bring down an economy and even a world, as happened with the failure of the Credit Anstalt in Austria in 1930 .

We have learned something since Bagehot wrote and the Credit Anstalt failed, but apparently not enough. The world is now in a financial crisis of unknown but apparently vast dimension. The veil of euphemisms that have been used to conceal the ugly reality of banks and investment funds wielding complex and sophisticated credit instruments with the carelessness of gamblers and the ethics of pirates has fallen . What is the reality that now stares us down? We don't know. This is not a face that we have seen before. Some features are familiar: there was the rich man's panic of 1907, the crash of '29 and so on: read Charles Kindleberger, *Manias, Panics, and Crashes,* and it's easy to think that this is deja vu all over again. But in no earlier panic have governments ever created (printed) trillions of dollars (and other currencies) to monetize private debt. We are familiar with the nationalization of banks and other industries. We are all too familiar with the nationalization of money which happened when governments abandoned the gold standard. The line between private and public in the modern state is blurry indeed, as is the distinction between money and credit. Using public credit to guarantee private debt crosses a line that we had not thought needed to be drawn. What does this mean and where does it lead? We need to find out and we need to find out quickly.

Perhaps the first question to answer is: why banks? What do banks do that we need and why do banks comprise a financial "system" that now seems to be holding us all hostage for a rather large ransom. We need to pay other people for things we want. For most of what we purchase it is not convenient to pay in person and in cash. So we tell our banks to pay them and these obedient servants find means to pay anyone, anywhere, any time. They do it by cooperating with other banks, and so we have a system. At any given time, most of the money in the banking system is in transit, banks owing payment to other banks and being owed payment from other banks. At the end of the day, banks must balance their books; this is, after all, other people's money.

What could go wrong? Timing. Let us suppose that on a nice day in April I decide to withdraw a largish sum from my account to buy cocoa futures. My bank's books will not balance unless someone else - perhaps the person from whom I purchased my cocoa futures - makes an equally large deposit. If not, my bank will have to make up the difference from its reserves. The bank which got my cocoa money will have an excess deposit, so perhaps the two

banks can share reserves.

What if I needed to buy my cocoa futures and I did not have a large sum to withdraw? My kindly bank, noticing that other of its depositors were not bothering to withdraw the sums in their accounts, offers to tide me over with a loan, payable in say thirty days, with interest. A mere trifle, the banker and I agree, in terms of the windfall I expect when I sell my cocoa. Let's assume that I have done this before, and the cocoa grower from whom I purchased the right to buy his crop usually shared similar expectations about the cocoa market. But on this occasion, the consumers of chocolate have deserted the market and I am forced to sell my cocoa for less than I paid for it. (Addictions are not as dependable as the drug companies would have us believe.) I assure my banker that I will find the money elsewhere to repay the loan, but he will have to allow me more time. I notice a frown on my banker's face and in due course we learn what that expression portends. It turns out I was not the only one speculating on cocoa futures. And most of that speculating was being financed with other people's money. A financial system depends on impeccable timing of repayments. Thanks to me, it was now seriously out of synch.

The accounting that keeps track of payments is relatively simple , a matter of counting the money in and the money paid out and noting the difference, if any. The accounting that keeps track of loans is more complicated since what is involved are "rates" (interest rates, rate of repayment) which means quantities (in this case, quantities of money) distributed over a specified period of time. Every change in quantity means a change in rate and every change in the length of the time period means a change in rate. What banks must do is coordinate quantities and time periods so that at the end of the day, so to speak, the bank comes out even.

We need banks to manage our payments and to lend us money. To do this banks must coordinate the individual transactions within the rates of distribution that characterize the whole system. This function, which is invisible to the individual, may be more important than the other two. It is at the core of the present financial crisis. To understand it we will need to look at how banks use their capital - their own money - and the reserves they keep on hand, or on deposit with a reserve bank, to balance the deposits and withdrawals of other people's money. But first we need to have in place a groundwork for understanding the sources of economic value and the role of money.

Economists approach money and banking separately from what they call value theory, theories of the determination of prices. They prefer to examine the price of cocoa in "real" terms, that is, how much cocoa will be given in exchange for how much cotton or cell phone minutes or whatever. Their efforts in this regard have met with one demonstrable success: they have convincingly demonstrated the *interdependence* of all prices. The price of cocoa will not be determined apart from the price of coffee or sugar or the supply of serotonin. (The demonstration of interdependence involves some rather severe and unrealistic assumptions but for the moment we will let those dogs continue to sleep.) Money is to be regarded as a medium of exchange and is not supposed to have any effect on prices. When it comes time to translate these "real" prices into money prices, prices denominated into actual currencies, the interdependence of prices will, of course, be worked out in money. Thus in the world of economists money is simply an instrument, a means of translating real ratios into common denominations. But in the world of banking, money is as real as cotton and it can be traded and bought and sold with both cunning and abandon. This trading of money has a feedback effect on "real" prices: speculation in commodity futures, financing inventories and so forth. So it has not escaped notice that the particular kinds of money we use and the amount of it in circulation

affects the price of cocoa along with all the other prices.

How exactly this happens is the subject of endless dispute. At this point we could review the dispute and recall some of the history of the events that have fueled that dispute. I would prefer to press on with our investigation of the current crisis with the hope and intention of simplifying our theories of money and prices, hoping to bring something more to the discussion than wailing and gnashing. I will make an immodest recommendation: to read in the collected works of F.A. Hayek, *Good Money, Parts 1 and 11*; therein will be found much of the story of what preceded the present crisis, and the historical context is covered in my introduction to these two volumes.

The determination of prices in "real" terms means that quantities or amounts of something - cocoa, for example - exchange for quantities of something else - cotton, for example - and we call that ratio of quantities a price. Even if we succeed in reducing the different standards of measure - ounces and bales - to the common measure of money we still have to find out how much money. I hear a murmuring of the word "market". Markets, the place, the gathering, replacing plunder with peaceful exchange, were and are a fine means of exchanging what we have for what we would like to have. Do we dare use one term, one apparently simple concept to account for a range of activities that includes a Saturday's garage sale and farmers market, the Mall of America, the circuits of e-Bay and Alibaba, the trading floors of stock and commodity exchanges with their dominating computers, and not least, the rituals of real estate brokers?

We use that one term at our theoretical peril. Why? We run the risk of two fallacies which I will mention because we must keep them in mind for this discussion. The first is commonly known as the fallacy of composition: which consists of attributing what we believe to be true of the part to the whole. In this case, attributing what we believe to be the behavior of the individual participants in a market to the market as a whole. The second fallacy is the fallacy of uniformity. This is common, though not commonly recognized, to most sciences, not just economics. This is the assumption that the separate parts that comprise a whole are all the same.

If we rely on the concept of a market - a coming together of traders at one place and one time to sort our how much of one thing for how much of another - if we rely on a process of sorting out to explain the determination of prices we must find a way to measure the differences of what is being exchanged in the market in a common medium, something that looks and feels very much like a "field", in which we may locate the determinants of what we experience as economic value. Markets are the centrifuges and compressors through which heterogeneous bits come to adhere to - or repel - other bits and what we all come away with is the appropriate value for what we leave behind. Or so the economists' model would try to convince us. Somehow, guided by "value", prices - those ratios of so much of one thing for so much of another - emerge in markets. Somehow through some process of longing and fulfillment we discover the respective values of cocoa and cotton and we share that discovery through the instantaneous blabbing of cell phones. (There is a serious aspect to this process. For the technically and serious-minded among us, I recommend Philip Mirowski, *More Heat Than Light.* In the right hands, the concept of value can perform as many wonders as the concept of energy, and mathematical descriptions of these wonders turn out to be embarrassingly similar.)

I do not think economists were wise to leave this process up to beginners. True, longing and fulfillment are individual, subjective states. One man's waffle, as my father used to say, is another man's cow flop. Subjective differences may be so wide that no exchange is possible; or we may have no differences at all in which case no exchange will be advantageous. As Kenneth

Arrow has pointed out, if there are no differences in a market, there will be no trading.

Whoa. Yes, I know what I just said, and there is something not quite right about it. If the interdependence of prices is resolved into particular prices discovered through a process (a day at the market) then value must be the result of a process. But this means that *differences* must precede *value*. (No differences, no trading. No trading, no value.) To be clear: value is not something that is inherent in a commodity or service or house or cell phone minutes. Value is the result of a trading process that discovers the particular prices that prevail on the day of the market. We are speaking here of economic value. Although we commonly refer to the value of a diamond, for example, or a box of chocolates, we also refer to sentimental value, aesthetic value, and family values, which suggest different attributes, not easily discovered in market trading. We cannot abandon our various notions of value, but we need to be clear that when we speak of economic value we mean something that governs exchanges, the trade-offs of one thing for another. We must face the uncomfortable possibility that although markets determine prices, differences determine markets.

How are differences to be discovered? At the family breakfast table, we all soon learned just how different we were in respect to waffles. We were able to communicate our differences because we had the actual waffles to refer to: the cow flop gradient emerged after repeated disappointment. Those of us in a hurry accepted a softer waffle than those with the time and patience to wait for the crisp. Timing plays a large role in the process of longing and fulfillment.

Let's be clear why we seem to be wandering into the intimacies of a breakfast table. Economists believe that they can demonstrate that prices are determined apart from money.

But the only prices that most of us are familiar with are ratios denominated in money. Somehow money and what we think of as value have to come together; were this not to happen, we should dispense with money, shutter the banks, bid adieu to financial crises and confront our longings and fulfillment straight on: we would have to reckon in bales of cotton and ounces of cocoa. Of course, I must mean that the *value* of a bale of cotton must equal the value of some number of ounces of cocoa. (If we lived in cocoa growing country it is likely that some measure of cocoa would soon begin to serve the same function as money; likewise for cotton. This indeed has been the history of money; cattle, tobacco, salt, beads have been used as currency. But we want a way to measure the value of what the currency represents.)

Meanwhile, back at the breakfast table, the waffle batter has been poured into the iron. I will now introduce the term that economists hold most dear. Marginal. Heat and time are being applied to the waffle batter, and with each increment of time and heat the batter is firming. The physics of the process is such that each successive increment increases the firmness more than the preceding increment. Until some optimum crispness has been achieved. Should we continue to add heat and time to the process the waffle would be burnt to a crisp. One man's waffle may be another man's cow flop, but if left in the iron too long, every man's waffle becomes carbon.

The term *marginal* is applied by economists to the contribution made to production or satisfaction by successive increments of whatever. The concept is most useful - it may only be useful - when known and finite quantities are involved. If we wish to allocate our fixed resources among more than one but still finite number of possible uses we may find an optimum allocation at the point where the marginal application of each increment of our resources is equal. However, to determine the known and finite turns out to be a challenge that can - when

crises such as the present one occur - make economists think about finding another line of work. If prices - values - can only be found at the margin, what happens when we cannot find the margin? Consider our humble waffle iron: if heat and time continue to be added to the batter we end up with a burnt waffle. But were we to establish a continuous process where batter is poured and waffles are removed, then the same increments of heat and time can produce tasty waffles indefinitely. There would be no margin. Whether heat and time will be subject to diminishing marginal productivity depends on the boundaries of the process. It turns out that our homely cow flop gradient is at the core of most of life's processes: time and heat, time and light, time and energy.

The cow flop gradient may be at the core of most of the processes of life (think metabolism, or photosynthesis) but it is not at the core of most contemporary economics. David Ricardo and Thomas Malthus in the 19th century might have stumbled across it (they had grasped the consequences of differential rates of production in food and population) but the life sciences had not then included chemical and physical processes. As the 19th century wore on economists preferred to concentrate on the getting and spending that the poets deplored. Mostly they concentrated on spending. They decided that people spend their money according to marginal increases or decreases of satisfaction from alternative choices. Do I want to spend my remaining shilling on chocolate or beer? I will allocate my shillings so that no additional gulp of beer will bring me any more satisfaction than another bite of chocolate.

The hounds (representing criticism) are barking, but we won't release them. (Translated into ordinary experience, the barks are saying that for there to be marginal limits to consumption, one must already know exactly what one likes and what it costs. One who always knows those two things would be an ideal customer for. . . well, you can figure it out.) Let the economists make their marginal choices. We have a crisis to deal with.

My grandfather had a small dairy. There was surplus milk to be had, and eggs. Combined with flour by my grandmother's alchemy there were waffles. Out in the field, there were cow flops. Thus the source of the metaphor. But the cow flop gradient reveals an important implication: within the limits imposed by the alchemy of cooking, heat and time can be exchanged. For any desired degree of crispness, more time can make up for less heat and vice versa. So we find an effect of substitution that although dependent on both heat and time is not reducible to heat and time. It is a third variable. We need to measure this variable and so we do. We call it value. (Deriving the meaning of the term in this context has an honest lineage. It is the same meaning that allows us to speak of the numerical value of an unknown number in a mathematical equation.) We measure value by the result, the efficiency of the process which establishes the interdependence of two rates of application (or change) at the point where any increase or decrease results in loss. (Underdone or too crisp.) The boundary of the process is given by the ratio of batter to waffle iron and the iron forms the constant for the process in which time and heat are variables subject to the desired progress of the batter.

As it turns out, this concept of value is invaluable. Not only would mathematics be impossible without it, we could not measure the multitude of possible economic exchanges without it. An objection to this grand status might be made along the lines that value as I have presented it is little more than a simple feedback effect. It would not tell us why we want a waffle in the first place, or where on the cow flop gradient we would seize our waffle. It tell us only how to manage the gradient and for that there are thermostats to control heat and timing mechanisms as simple as the flow of sand through an hourglass. True, but we must set

parameters for such devices and how are those to be discovered? We must also allow for an additional variation of the result of exchanging heat for time: at different stages of the process, the exchange will not have equivalent results. (If we add heat, to save time, as the waffle nears crispness, it will accelerate the conversion to carbon.) As Max Born remarked in *The Restless Universe*, "we must already know some other quantity of the same kind if we are to judge whether a newly obtained number is large, small, normal or abnormal." In other words, we need values.

Why we want a waffle in the first place can also be discovered by the value connecting or controlling a rate of production and a rate of consumption. Our need for food is the product of two such rates and given the boundaries of the situation (morning on the farm) waffles were the simplest solution. Pancakes might have done, or eggs and toast, but waffles were cooked at the table, not in the kitchen. So family values, the unquantifiable, did play a part in the selection. But those values are not subject to economic exchange, though they do contribute to the differences we all bring to the market. They cannot be counted, but they ought to be taken into account.

We cannot determine any value in isolation. A single exchange, a solitary exchange of cotton for cocoa would not satisfy the Born condition: we could not tell whether that ratio was large, small, normal or abnormal. Whether we rely on marginal increments or some other means of weighing cost against benefit, we must know the boundaries of the scale. To measure the size of differences we must have a boundary at which there is no difference. Our task is to discover the point at which we may substitute one rate (of change in our variables, that is, heat and time) for another. For this we need the concept of value and we must translate that value into actual numbers.

We have not exhausted the account of the determination of economic value - far from it - but perhaps enough has been said to show how, if we want to determine value apart from money we would go about it. Of course, it would have been simpler to use our conventional notion of value, that value is inherent in things because of their usefulness or beauty, but such a notion, though simple, does not explain what happens in economic exchanges. If value were inherent, and somehow measurable, we would always know the price of everything. But we don't. We discover value in our attempt to coordinate rates of change; producing and consuming in a changing world. We discover prices in our attempt to trade what we may produce for what we want to consume.

So why money? We may as well begin our answer to that question with an observation made by John Maynard Keynes: "The importance of money," he declared, "essentially flows from its being a link between the present and the future." We use money to reduce the uncertainties of the market, the inefficiencies of barter. We sell in the present to buy for the future. Money comes into use to carry forward the value obtained in one transaction for use in another.

However, Keynes, whose great talent was to argue every side of an issue without letting go of any, also declared, "it is by reason of the existence of durable equipment that the economic future is linked to the present." The key word is durable. The capacity to continue into the future, to *endure* is to be durable. So we may link our economic present to our future with money and with durable equipment. These are means for coordinating rates of change. Money has the advantage over durable equipment since it also can serve as a measure of the value it carries forward. Equipment has the advantage over money since it can produce what we will

surely need in the future. Money only works if there is someone in the future prepared to produce and exchange for money. What Keynes did not say is that any economic link to the future is only as durable as its value.

The answer to the question, why banks, is to coordinate payments made in money. (We leave aside the matter of lending, but we will come to that presently.) The answer to the question, why money, is to coordinate the exchange of value. Coordination is only possible through some link between the present and future and that link is only possible if something retains its value. So an economic process is one that first discovers value and then tries to hang on to it.

I realize that breakfast has been over for some time and that we should now be thinking about dinner. We confirmed the value of waffles and each of us managed to have a waffle to suit our taste without entirely despising the others. Time moves at its own inexorable pace (and what that pace may be is subject to much dispute and there will be other occasions when we can weigh in on the matter) but whether sooner or later, our inner cow flop gradient - the one that controls our metabolism - will insist that it is dinner time.

Here is where we get to think about the concept of saving, the concept which made it possible for Keynes to claim that both money and durable equipment are links between the present and the future. If the cupboard is bare it means that nothing has been carried forward, nothing has been saved. We will have to forage for our dinner. Alas, the milk is still in the cow, the eggs are still in the chicken. Our timing is not good. If only we had saved some waffles.

If you have tried saving waffles you know that they have, as they say, a limited shelf life. We learn through experience just how perishable is most of what need to stay alive. Heat and time are the most perishable of all. What we persist in trying to do is to preserve the value of the perishable, to convert it into something of value that endures. We want to eat our waffle and have it too.

We need to make a distinction here and I am sorry to trouble you with it but we cannot grasp what we do with money without it. The distinction is between what is durable (equipment, waffle irons) and what is continuous (time, heat). What is durable is also continuous, but what is continuous may not be durable. Heat dissipates. The production of heat may be made continuously but heat, the product of differences, is lost in the elimination of difference. So it is with the value of money. Every single exchange constitutes an equality of the value at the point of exchange or substitution. Which means, to use the analogy with heat, that the *differences* which led to the exchange are dissipated. But the value of the exchange continues, indeed is required for subsequent exchanges. Thus our urge to capture that value in something durable.

Early on in the history of our species we found just the thing: specie, that is, gold or silver. It was bright and shiny, durable but malleable, and everyone seemed to like it. Just the opposite of cow flops. (Freud would have something to say about that.)

If gold the metal is to be used as gold the currency we must find a way to produce measurable units of it. We did, and governments quickly claimed a monopoly of the minting process. Governments made a profit from minting gold and silver coins and promised us a uniform currency in return. Here we must tread carefully. Did a uniform currency (the ideal, rarely the reality) actually provide for a uniform transmission of value, the link between the economic present and economic future. Or was it not the fallacy of uniformity? It is, as Keynes did not point out, the durability of the *value* of money (or equipment) that forges the link to the

future, not the durability of the money itself.

We will carry that question forward to following sections of this essay. Understanding the present financial crisis does not seem to be an easy task. We all are finding flaws in our framework, our basic models of how the world works.

One observation about how the world works before we move on: Capturing the value of the intensely perishable is the source of the success of most living creatures, not just the human economy. There is a wonderful book, *Bumblebee Economics*, by Bernd Heinrich, which provides a detailed account of how one of our fellow creatures manages to survive among the gradients. The bee relies as much as we do on the conversion of the perishable into the continuous (nectar into flight with heat as the medium and product).

I will hazard one generalization. The rise of the living standard of our species depends on our ability to capture the value of the continuous provision of perishable differences: the power of wind, water, heat, electricity, information. Were we to return to the writing of Ricardo and Malthus we could find within the outlines of their discussion (the infamous role of the law of diminishing returns which gave economics the slur of the 'dismal' science), we would find the shape of a process we have yet to explore. "The use of the original and indestructible powers of the soil" Ricardo wrote. Powers insufficient to provide for an unchecked increase of the human population, Malthus argued. Original powers, yes. Indestructible? Sadly, no. The value of the soil is as perishable as any unless we find a way to bring it with us into the future.

Stephen Kresge

Big Sur, California

This is the first part of what will be a multi-part essay, an investigation into economic thinking and the roots of the present financial and economic crisis. In short, a study of yearning and learning.