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BY ELVEANDER WELFENDORFF

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About EW JOURNAL

In a lecture hall, a model of discounted cash flows stood on the screen. It was correctly derived, and its denominator did exactly what the textbook had promised. I could reproduce it, and I could explain which term moved when the rate rose. The room had fallen into the particular silence of students who have understood the formula and not the thing, and for some time I was one of the more reliable sources of that silence. What I could not have said was why any of it existed. Nobody said that a discount rate is a small confession: we prefer the present, reliably and somewhat irrationally, and we have agreed to put a number on that preference and charge each other for it.

This journal grew out of the distance between those two ways of knowing.

I came to finance late, and from the side. Before it there were years of law, then the humanities, then the Italian Renaissance, though less its paintings than the practical life underneath the frescoes: the merchant guilds, the Lombards, and the bill of exchange that travelled between cities carrying nothing but the standing of the house that had written it. No gold stood behind that paper, and no army. There was a reputation, and a stranger far away who chose to believe in it. It seemed to me then one of the most extraordinary things our species has done, and it seems so to me until today. The longer account of that path belongs on another page.

When I returned to university to study finance properly, the textbooks were excellent and the examinations were fair, and I passed them. Something still refused to settle. I was being taught the discipline correctly, in a dialect I did not yet think in, and anyone who has learned a foreign language as an adult knows the gap between hearing it spoken well and being able to dream in it.

So I began to translate. By this I did not mean simplifying, which is what the verb usually means in this vicinity, but translating into my own terms. A concept sat in my notes as a formula, and I would turn it slowly until it became something I recognised: a paradox, an old argument in new clothes, a dispute somebody had already conducted in the seventeenth century under another name. Leverage became ambition borrowed from a future that had not consented to lend it. Aristotle's unease about money breeding money turned out to be alive; it is quietly decided again every time a central bank sets a rate, and we have stopped noticing that the matter was settled by assertion rather than by argument. The Dutch tulip trade, read closely, teaches remarkably little about tulips.

The method of EW Journal has two steps. First comes the financial category, in its exact and proper form. Then comes the human question underneath it. Debt is a liability with a repayment schedule, and it is also the present bargaining with a future that has no vote. Liquidity is a property of markets and a temporary agreement among strangers that tomorrow somebody else will be willing to hold the thing. In each case the financial description is true, complete on its own terms, and still insufficient.

Five themes organise the journal, five doors into a single building. Value concerns how an object acquires meaning, and where that meaning goes once the price has been paid. Capital concerns what ownership permits

a person to do, what it obliges him to do, and why the instruments that build a fortune so often threaten its survival. Time treats the future as something that can be bought and borrowed against, until compounding reaches the edge of a finite life. Risk begins with measurable probability and ends with the older problem of how intelligent people behave once the future becomes frightening. Power concerns the quiet authority to define the units, borders and hierarchies within which everybody else must decide.

A reader will not find market commentary here, nor investment advice, nor news, nor the motivational cadence of five lessons learned. There is no display of wealth, for the sufficient reason that none exists to be displayed. I claim no authority in the discipline. I began as a reader, became for a long time an interlocutor asking questions in a conversation I was not qualified to lead, and somewhere in the accumulation of those hours became the author of a way of looking at finance, which is a far more modest thing than authority over it. What the project hopes for is narrower and harder to obtain than reach: a voice that a reader recognises before the name appears.

One more thing seems better said here, once, than discovered later.

Much of the translating happened in dialogue: with books, with people, and over several hundred hours with artificial intelligence. The models were a patient interlocutor that allowed me to ask the same question eleven ways, at two in the morning if necessary, until one answer arrived that I could feel as well as verify. Thirty attempts before an idea could stand unassisted were not unusual. A formulation came back academic and I pushed; it came back glib and I pushed harder; sometimes it came back elegant and hollow, the most tempting failure of all, and I threw it away. On some evenings the only product of an hour was the discovery that an analogy I had defended for three days was false. The machines supplied fluency and breadth of reference, and a tireless willingness to reformulate. Whether a sentence was true to the thing, whether it illuminated finance or only decorated it, they could not judge. That judgement remained mine, exercised badly at first and then a little less badly.

Editorially, therefore, the line falls in one place. Every essay is selected, argued, cut and signed by one person, who carries the responsibility for each claim and each historical reference, misjudgements included, and shares it with no system. The images follow the same arrangement: the allegories, the composition and the decision about what is shown and what is only suggested are mine, while the rendering is the work of machines, and I see no reason to pretend otherwise.

Whether writing made in dialogue with a machine can belong to anyone is an older question than it appears. Montaigne thought among his library and argued at length with dead Romans, sometimes unfairly, and the arguing was the essay. The letter writers of the eighteenth century reached, across weeks of correspondence, conclusions few of them could have reached alone. A footnote is a technology, and so is a tutorial. In every age the real question has been whether a mind was doing the choosing. Here there was one, and there is.

Somewhere near this position, I suspect, stand others: humanists who found the vocabulary of finance alienating long before they found it beautiful, and people inside the industry who read poetry on the morning train and would prefer it not to come up in their annual review.

The bridge is real. It had more than one engineer, and only one of them must answer for whether it holds.

– *Elveander Welfendorff*

THE BOND WITH WIDE MARGINS

Fifty Guilders a Year, For Ever



Whoever wrote out the bond in the spring of 1648 left generous space on both sides of the text. The text itself is brief, in the legal Dutch of the period, and the published accounts give its terms thus. The water board of the Lek dyke, through its cameraer Johan van Hogenhouck, receives one thousand Carolus guilders from Niclaes de Meijer, a canon of the Oudemunster in Utrecht, undertakes to pay him fifty guilders a year for ever, and promises the same to his successors or assigns.[1] Those few lines would have done the work alone. The rest of the skin, vellum in the Beinecke Library's word, was left bare.

Keeping the promise meant writing on it. Each time the interest was paid, a clerk wrote the date and the sum beside the original promise, in the margins or on the back, so that the document carried its own record of how well it had been honoured. Payment after payment, in one hand after another, the empty skin filled with small entries, from 1648 until the 1940s, when no room

remained and a paper addendum called an allonge was attached to continue the record.[2] The bond kept its own books.

Parchment arrives with a legend. The story, told by Pliny on the authority of Varro, has the king of Pergamon, short of papyrus because his Egyptian rival had forbidden its export, having parchment devised in its place, and the Latin word for the result keeps the name of his city.[3] Skins last, and scribes are often said to have used the margins for private remarks about cold, bad ink and the hour.[4] The clerks of the Lek seem to have said nothing of the kind, at least in the descriptions that have been published, and their margin is all dates and sums.

Carolus guilders, in which the bond is reckoned, take their name from Charles V, in whose lands the Netherlands lay when the coin was first struck, and each was worth twenty stuivers.[5] A canon of Utrecht in 1648 would have known the emperor's name from his money more often than from his history.

In September 2015 a curator from Yale named Timothy Young took that paper strip to the Netherlands. The skin stays in New Haven, and the library lets only the addendum travel.[6] At the offices of the water authority he found, as he remembers it, a big conference table and a gigantic cheque of the kind that sweepstakes companies hand to winners, and he left with the promise of twelve years of arrears, a little over 136 euros.[7] Twelve years at 11.35 euros come to that. The money itself, by one account, arrived by wire transfer, a gigantic cheque being awkward to bank.[8]

Young took the occasion in good humour. He suspected the authority of putting him to use as publicity, and he observed that had he arrived with a bond paying a hundred thousand euros a year, his hosts might have been less cheerful.[8] On the BBC the host remarked that the journey to see the bond costs more than the interest it pays, and Geert Rouwenhorst, the Yale professor of finance, answered that he had been visiting family anyway.[9] The sum is absurd and so is the cheque, yet the authority paid in full at the old rate, arrears included.

It was paid.

Dated 15 May 1648,[1] the bond shares its day with a different set of promises, sworn that morning in the town hall of Münster in Westphalia, with the doors open to the street and a crowd looking in.[10]

Spanish envoys swore first. A silver cross lay in a large Bible, which the priest of the Spanish embassy held open, and the two plenipotentiaries laid their right hands on it. Peñaranda read the oath in Spanish, and when he came to God as judge he and his colleague raised their hands and kissed the cross. The Dutch swore after them in another manner, each raising the index and middle fingers of the right hand and pronouncing in turn the French words for so help me God.[10]

Each side had brought its ratification in a casket. The king of Spain, who had signed himself Yo el Rey and sealed the document in solid gold, sent his in red velvet with silver mountings, a casket that one historian of the occasion says looked like a treasure chest. The Dutch casket, he adds, resembled a large cigar box.[10] Gerard ter Borch was in the room, painted the scene on copper and put himself into it, at the far left, a witness who happens to hold the brush. To make the picture work he gathered both oaths into a single moment, although the Spanish had sworn before the Dutch.[11]



15 May 1648

Next morning the ratifications were proclaimed again from the steps of the town hall, and the reading went on for hours, in three languages that most of the listeners could not have followed.[10] Eighty years of war ended in oaths and proclamations. The bond of the same date named a cameraer and carried, as far as the published accounts say, no gold at all.[1]

Two promises were made that day, and only one of them had a painter. The other had a clerk, and a succession of clerks after him, who were still adding entries in the 1940s.

Spain's promise was one of abstention. It gave up a claim and from then on required nothing, which needs no clerk and leaves no margin. The bond asked for something every year, a sum of money handed to a person who could prove nothing except that he held the paper. Between sovereigns no judge stands above either party, and a treaty lives on honour, interest and the balance of forces, all of which move. A dyke board is a humbler body. It has a territory, a tax on that territory and officers who answer to those who pay, and the river, which has never been known to change its mind, sees to the rest.

Madrid had suspended payments to its creditors in 1647, as it had on several earlier occasions, among them 1627, 1607, 1596, 1575 and 1557, and the gold seal on the ratification was affixed by a treasury that had learned to renegotiate.[12] A dyke board cannot renegotiate with a river.

Shakespeare, about 1597, gave the English-speaking world its best-known bond, a pound of flesh pledged by a merchant of Venice, and the audience watched a document whose whole drama lay in what would happen if it were not honoured.[13] The Lek bond has the opposite shape. Nobody has had to ask what its penalty is, because the document has spent its life recording, in a neat hand, that the sums fell due and were paid.

On Monday 22 March 1621 a soldier at the castle of Loevestein sat down on a wooden chest and began to swing his feet against its side.[14] The chest had carried books into the castle, and it was now carrying out the prisoner, Hugo Grotius, condemned to life imprisonment for his part in the quarrels of the Republic and hidden among the books.[15]

His wife Maria devised the plan, and stayed behind. The work of getting the chest to the boat fell to the maid, Elsje van Houwening, who in the version attributed to her saw the soldier at his seat and asked him to move, since there was porcelain inside that might break. A guard remarked on the weight. Books, the maid replied, carry spirit and are very much alive.[14] Tradition has also given her a neater line, that the chest held the Arminian books, with a guard answering that perhaps it held the Arminian himself. I cannot trace that exchange to a primary source, and I leave it where I found it.[16]

Grotius reached France and wrote there the book that students of the law of nations still read. Published in Paris in 1625, it held that a perfect promise conveys a right to the person to whom it is made, and, in its chapter on good faith between enemies, that a promise confers a new right of itself, whatever the state of the war.[17] The book had been in print for twenty-three years when the Spanish and Dutch envoys laid a hand on a cross or raised two fingers at Münster. A man who had left prison in a book chest had some reason to think about words that no guard enforces.

Amsterdam's Rijksmuseum has long shown a chest as the one. The museum's wording is careful: the chest on display, it says, was long thought to be the one from the famous story.[18] At a hundred and sixty centimetres wide it would have held a man who folded himself with care, and the museum claims no more than that.



Loevestein, 22 March 1621

Peace came too late for him. Grotius died at Rostock in August 1645 on a journey back to Germany from Sweden, whose ambassador in Paris he had been, and the last words reported of him are that by attempting many things he had accomplished nothing, a remark that the Stanford Encyclopedia of Philosophy calls probably apocryphal.[19] Three years later the powers whose duties he had catalogued swore their oaths without him.

The bond calls Niclaes de Meijer a canon of the Oudemunster in Utrecht, and by 1648 the Oudemunster had been gone for more than sixty years. On St Martin's Day 1587, the feast of the saint who divided his cloak, the city sold the church for 12,300 guilders, and the demolition followed; apart from a school beside it, nothing remained above ground.[20] The outline of its choir and part of its transept can still be traced in the paving of the Domplein.[21]

Its chapter outlived it. The chapter found rooms in the abbey of St Paul, and in 1596 it was lent the abbey church as well, which came down in its turn in 1706 as dilapidated.[22] Catholic worship in the city had been stopped in 1580, and the chapters of Utrecht carried on as Protestant bodies until a decree of Napoleon abolished them in 1811.[23] The canon of 1648 may therefore have been a Protestant regent drawing a prebend from a church that no longer stood. I have not found what the title meant for Niclaes de Meijer himself, and the bond does not say.

English chantries, endowments that paid priests to pray for dead donors for ever, were dissolved by act of Parliament in 1547, and land set aside to outlast the world was taken back by the Crown.[24]

Dante had put the usurers in the seventh circle of hell, on burning sand, each with a purse hanging from his neck, and the purses bore coats of arms.[25] Three centuries later canons and merchants in the Low Countries still lived on interest, which the Church called usury, and they lived on it under a form of words. The form was the rente, an annuity charged on land, and the buyer was said to have bought an income.[26] Pope Innocent IV is recorded as having declared the contract licit in 1250 or 1251, on the ground that such rents were sales, since they never had to be repaid; where there is no loan, ran the maxim, there is no usury.[27] The fiction had a price. The buyer could never demand his money back, since a demand would have turned the sale into a loan, and the right to redeem lay with the seller alone. Fifteenth-century papal rulings, as Munro describes them, said so.[28] A buyer who wanted his capital sold the income to somebody else.

Redemption is where the Lek bond departs from the pattern. On the account that Yale has published it cannot be called, so the right of redemption that belonged to the seller, here the board, has gone missing, and the board bound itself to pay for ever, to whoever holds the paper.[29] I have not been able to read the full text and cannot say whether the scribe of 1648 wrote the sale of a rent or the receipt of a sum. My guess, offered as a guess, is that the canon wanted an income that sat comfortably in a chapter house, the board wanted money that it would never have to return, and the old form gave each of them a respectable name for what they were doing.



the form of the rent

From the sky the money of 1648 can still be seen. It paid the workers who built a cribbing, a line of piers pushed out into the current on a curve of the Lek near Honswijk to slow the river and stop it eating the bank. According to the scholars who have written about the bond, the structure still shows up in satellite images.[30] It is a rare thing, an investment of the seventeenth century that can be found on a map.

Impatience is an old habit of the river. In the winter of 1624, drifting ice and high water broke the Lek dyke at Tull en 't Waal, near Houten, and the gap stayed open for three months.[31] The place keeps the memory of earlier breaches in its name, since 't Waal means the pool that a breach leaves behind, and a record of 1307 already calls it Wale.[32] The present dyke-reeve, Jeroen Haan, whose Dutch title, dijkgraaf, means literally a count of the dyke, has told an American interviewer that the water almost reached Amsterdam and Rotterdam, some forty kilometres away.[33]

Bonds raised the money, 23,000 guilders of it. On 10 December 1624 one of them, a sheet of animal skin about thirteen inches by twenty-four, went for 1,200 guilders to a woman in Amsterdam.[33] The calendar is awkward here. A Dutch news site places the breach in January 1624, which suits a bond sold that December. The national broadcaster gives 31 December 1624, which would have the board borrowing three weeks before the water came. The accounts do not notice.[34]

Some reference works give her a name, Elsken Jorisdochter, which I could not trace to a primary source and offer as a rumour with a good ring. She was buying a claim on the dyke that stood between her city and the river, and if it failed a second time her claim would go under with the land behind it. A board that missed its instalments would find the next breach financed by nobody, and water does not negotiate or accept a restructuring.



whom the water harms must stop the water

Her bond travelled. In 1938, by the account of a numismatic newsletter, an Amsterdam board member of the Amsterdam exchange named Albert Andriesse, who had bought it at auction, took it to New York as a token of friendship when the boards of the Amsterdam and New York exchanges met, and presented it to the New York exchange.[35] In December 2024 two of its representatives travelled to Utrecht and received about three hundred euros in cash, interest for some twenty-two years, and handed it on to the village museum at Tull en 't Waal.[36] The bond yields 13.61 euros a year, and the museum that keeps the breach in memory now holds the proceeds of its repair.

Sometime in the mid-1730s a young Scot was walking in the cloisters of the Jesuit college at La Flèche, in Anjou, where Descartes had been a pupil more than a century earlier, with a Jesuit of some parts and learning, who was urging on him a nonsensical miracle performed in the convent. The adjective is Hume's. His head was full of the Treatise he was composing, and he produced an argument that he thought very much gravelled

his companion. The Jesuit replied that it could have no solidity, since it told equally against the miracles of the Gospel as against those of the Catholics. Hume, telling the story to a clergyman more than twenty-five years later, thought it proper to admit that as a sufficient answer.[37]

Later, in the essay that grew out of that afternoon, Hume asks of every report how many witnesses vouch for it and what manner of men they are.[38] By that test the margin of the bond is heavy testimony, written by many hands over nearly three centuries, none of whom could consult the others. Hume would have noticed that every witness served the debtor, and that the bond has no other. The book he wrote at La Flèche fell, he reported, dead-born from the press.[39] Its third part, on morals, appeared in November 1740, and it contains a page about two neighbours and a meadow. Two neighbours may agree to drain a meadow they hold in common, because each can know the other's mind and can see the whole project fall if he shirks. With a thousand persons, Hume says, each would look for an excuse to leave the cost to the others.[40]



heavy testimony

Hume's thousand persons, in effect, had been meeting at the dyke for centuries. Foreigners remember a Dutch boy with his finger in a dyke, a legend that reached them through an American novel of 1865 and is not widely known in the Netherlands itself.[41] The real defence was a tax paid by everybody behind the wall, and a promise from the people with land to go on paying it. Much of the country lies below the level of the sea or of the great rivers, and a dyke is the difference between a farm and a lake. The older rule held that whoever the

water harms must stop the water, which put the cost on the people at the dyke, while neighbours inland, dry behind the same barrier, often declined to pay.[42] Water boards answered the difficulty long before Hume posed it. They had powers that two neighbours never needed: to tax, to summon the whole district and, in an emergency, to raise it into what the Beinecke Library calls a dyke army.[43] In later centuries, as the heritage panels of the present authority tell it, the church bells rang when the water stood at a marked height, and the army marched out to walk the dyke.[44]

Founded in 1230, according to the inventory of its archive, the board of the Lek dyke had no permanent place to keep that archive until the end of the nineteenth century.[45] The promise has been kept better than the archive.

At the counter a man arrives with a skin of vellum folded inside his coat, a stranger to the board, and lays it down. The bond says that payment is promised to the canon “or his successors or assigns”, and the board has kept no list of who those might be.[46] The clerk finds the last entry in the margin, reads it, and pays, and then he adds an entry of his own. Whoever comes to the counter with the vellum in his hand is the creditor, and the procedure ends there.

Annuities in Holland moved from one owner to the next through an official register, which charged a fee and a duty of 3.3 per cent on each transfer,[47] and which lived exactly as long as the office that kept it. England had kept its public accounts on wooden sticks. The Exchequer cut notches for the sum, split the stick lengthwise, and gave the creditor the longer half, the stock, while the treasury kept the shorter, the foil, so that a forger had to match the grain of a piece of wood he had never seen.[48] In October 1834 the old sticks, long since superseded, were fed to the furnaces under the House of Lords, and the fire spread and destroyed most of the Palace of Westminster.[48] The vellum needed no office and no matching half. It travelled in a pocket and carried its whole claim on its face, in a Dutch that today’s owners could not read unaided, so that Yale had to find an expert to decipher the hand.

Older societies saw the trap in an everlasting debt and built a door into it: Leviticus ordered that in every fiftieth year land should return to its family and bondsmen go free.[49] The Lek bond has no jubilee. Its sum was halved in the seventeenth century, though nobody recorded how, but nothing in it ever expires. Nobody lives for ever, and the promise had two ends. The canon would die, and so would his heirs, and so would theirs. The board’s members came and went with the land they owned, and the clerk who made the first entry in the margin could not know the name of the clerk who would make the hundredth. A promise between two men ends when either dies. This one was made between a chair and a chair, and somebody has always been sitting in both.

Because there was no register, the board had nothing to consult when Yale appeared in 2003 with its claim for arrears, and a thief would have found the counter equally welcoming. If the vellum were lost, Rouwenhorst says, there would be nothing to present, and the claim would simply cease.[9] A bearer bond is a wager that people take care of paper that pays them, and this one has won it so far.

Few of its kind are left. Haan has said that seven of these bonds are known to be out there and that the board knows where five of them are.[36] I can place five by name: the bond of 1624 in New York, one of 1634

that sold at Freeman's auction house in January 2020, the pair of 1638 and 1765 in the archive of the Amsterdam exchange, and Yale's.[50] The two from Amsterdam, one for 3,200 guilders and one for 1,000, now pay 2.5 per cent, so the board was still issuing the instrument a hundred and twenty-seven years after the earlier of the pair. In September 2024 the exchange held a gong ceremony for them, and its release called them a symbol of the financial reliability of the Netherlands.[51] A gong is a modest honour for paper of that age.

Originally the bond paid five per cent, and the Yale accounts agree that during the seventeenth century the rate was cut, first to three and a half and then to two and a half. The sibling bond of 1624 pays 13.61 euros on 1,200 guilders, which is two and a half per cent, which does not square with five.[52] None of the sources says when the cuts came or by what authority. No source I found records who proposed them, or who said what in the room, which is a pity, since the promise was tested in that room.

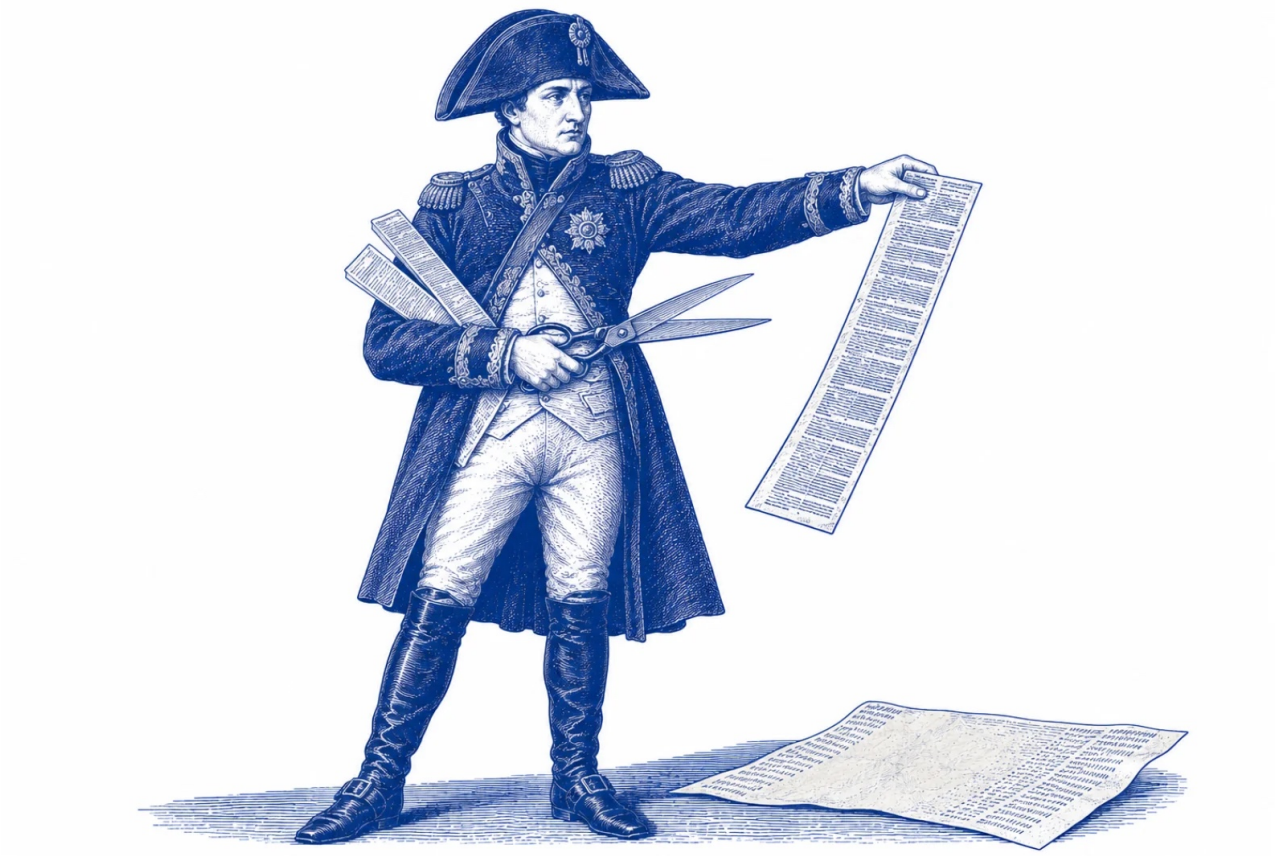
We know a good deal about a different room. In 1652 the young Johan de Witt, who would be Grand Pensionary of Holland the following year, proposed to cut the interest on the province's debt from five to four per cent, and the proposal was shelved after an uproar.[47] Three years later it passed. In March 1655 the province's short bills were said to trade at 105 to 107 per cent of par, and in August the States used those prices to force the cut through, with the savings going to a redemption fund meant to clear the debt in some forty years.[47] The debt he was trimming was a young one. By 1650 it stood at about twelve times the province's annual tax revenue, and the short bills had been renewed so habitually that historians call them de facto perpetuals. The dyke board's perpetuity had been decided once and written on skin, whereas the States' had merely happened.

Between 1650 and 1653 the States had paid their creditors about seven million guilders a year more than they borrowed, and private rates sank to four and a half per cent by 1655 and below four by 1660, when the best merchants of Amsterdam were borrowing at three to three and a half.[47] A debtor who has promised five per cent in perpetuity, in a market that offers three, watches the tide go out from under his own mooring.

Today the bond pays twenty-five guilders a year, which come to a little over eleven euros. The promise was kept at half.

Napoleon tried the same arithmetic on a whole nation. In July 1810, within weeks of annexing the kingdom of Holland, he ordered the tiercering, which reduced the interest on the Dutch national debt to a third of what had been promised. The treasury had paid nothing on its bonds in 1808 and 1809. Holders of government paper saw their income cut to a third at a stroke.[53] The two Yale scholars who have studied the Lek bond report that the dyke board, all the same, went on paying in full through that year, and the claim appears, so far as I can find, only in their own article.[54]

One reason suggests itself, and I offer it as an inference. The state's creditors were scattered and could not press a conqueror. The board's creditors held a claim against land that lay behind a dyke on which every landowner depended, and the money had gone into a cribbing in the river that anyone could inspect from the bank. A creditor of the board could walk down to the river and look at what he had paid for. A creditor of the state could look at a decree.



July 1810

Yale bought the bond at auction in 2003. A Belgian broadcaster gives the price as about 24,000 euros, a figure with no second source, which at 11.35 euros a year would be a little over two thousand years of interest.[55] For the canon of 1648 it was worth the thousand guilders he had lent. A collector buys the margin: nearly three centuries of small entries in different hands, each of which says that on this date, in this year, the debt was honoured.

Fifty guilders at five per cent were worth exactly the thousand that the canon paid, since a perpetuity is a single division of the yearly payment by the rate. At that rate the first hundred years of payments carry more than 99 per cent of the price.[56] The collector paid about 24,000 euros for a yield of under five hundredths of one per cent. A lender prices the bond by what it pays, and a collector by what it has paid.

Johan de Witt, the Republic's best-known pricer of promises, put before the States on 30 July 1671 a treatise on the worth of life annuities compared with redeemable ones, which argued that an annuity paying a guilder a year should be sold for sixteen. The States had been selling them for twelve and had proposed fourteen, and in October they issued new annuities at fourteen.[57] In the disaster year of 1672 the States of Holland declared a moratorium on redemptions, though not on interest, and their bills fell to 30 per cent of par.[58] On 20 August armed men of The Hague stormed the Gevangenpoort, where Johan had gone to visit his brother Cornelis, dragged both brothers into the street and killed them. The bodies were hung from the

gallows on the Plaats, and bystanders carried off pieces. Nicolaas Witsen, later mayor of Amsterdam, kept Johan's tongue and a finger of Cornelis until 1717.[59]



Johan de Witt, who priced the promise

Rouwenhorst says very old bonds are rare because issuers tended to default. Russia issued perpetuities, he told a reporter, and so did the French government, and all of them at some point defaulted. He calls the survival of the Lek bond a miracle.[60] The failed ones have left no margins to read, and the water board's record gains some of its lustre from the absence of rivals. Another bond in that library, of about 1622, was issued by the Dutch East India Company and no longer pays anything, because the Company, which had ships, forts and a monopoly of Dutch trade with Asia, ceased to exist at the end of the eighteenth century.[61] The dyke board had none of these. Its paper goes on because the river is still there.

Commentary on the bond keeps its books less carefully than the clerks did. The payment of 2015 appears as 136.20 euros in one account and 132 in another, though twelve years at 11.35 come to the first. The paper addendum is dated 1943 in one account and 1944 in another. Yale's price is given once, at about 24,000 euros, and a different bond of the board fetched 24,000 dollars at Freeman's in 2020. The Amsterdam exchange counts nearly 1,500 per cent paid out in interest on its bonds since 1638, which 386 years at 2.5 per cent do not reach, unless the early rates were higher. Margins, it seems, keep better records than the people who write about them.[62]

States have no river to keep them honest, only a Treasury that can read the price of money. In December 2014 the Chancellor said that the 3.5 per cent War Loan, nearly two billion pounds of it, would be repaid on 9 March 2015. It dated from 1932, when the government converted the 5 per cent war loan of 1917 into a cheaper one, under a slogan that, according to the registrar's blog, ran: unlike the soldier, the investor runs no risk.[63] Another undated loan, the 4 per cent Consolidated, redeemed on 1 February 2015, five weeks earlier, went back in part, the Treasury said, to the capital stock of the South Sea Company of 1711.[64] More than 120,000 people still held the War Loan, 97,000 of them with less than £1,000 and almost 38,000 with less than £100. The Chancellor called it a moment for Britain to be proud of, and the government gave its reason without ornament: interest rates were low, so it could refinance.[63]

Britain's Treasury saw what the States of Holland had seen in the 1650s, a falling rate, and held what the dyke board lacked, the right to repay. He used it, and honoured the promise by ending it.

Credit Suisse was rescued by UBS over a weekend that ended on 19 March 2023 with a decree. The regulator ordered about 16 billion francs of the bank's Additional Tier 1 bonds written off under an emergency ordinance of the Federal Council, while the shareholders, who rank below the bondholders, received shares in UBS.[65] The bonds carried a clause permitting a write-down in defined circumstances, and over that weekend the Swiss state held the clause in one hand and an emergency in the other, and it used the emergency.

Judgement arrived in October 2025, when the Federal Administrative Court annulled the decree, finding that the contractual trigger had not occurred and that the emergency provision was unconstitutional in several respects, and it did not yet order a remedy. The regulator and UBS appealed, and the Federal Supreme Court gave UBS's appeal suspensive effect, so that the write-down stood meanwhile.[65] In July 2026 a United States court of appeals held that Switzerland could not be sued in American courts over the affair, since it had coerced Credit Suisse into selling itself to UBS in the exercise of its sovereign authority.[66] At the latest report the Federal Supreme Court had not ruled, and the margin on that bond was still blank.

Eleven euros a year is a sum hardly worth disputing, so the board's reason for paying cannot be fear of the claimant. One reason may be reputation, since an authority that lives by a tax on the neighbours of a dyke needs a name for paying; another is the river again. The one test of the kind that I can find came in 1810, when the state cut its interest to a third and the board, by the Yale scholars' account, went on paying. Each clerk who made an entry could have stopped. None is recorded as having done so.



held there by a standing order

Descartes is credited with a saying, though I cannot find where he said it, that God made the world and the Dutch made Holland. Seen from the Lek, the remark is a claim about bookkeeping, since every acre below the river is held there by a standing order.[67]

Hannah Arendt called promising a way of setting up islands of security in an ocean of uncertainty.[68] Somebody builds a wall, somebody keeps it, somebody is paid for keeping it, and somebody writes down the payment.

Vellum has outlived the guilder, the Republic and every clerk who wrote on it. Nobody who wrote the bond could have known who would hold the paper, who would sit on the board, what the rate would be or how the century would end, and the margins were wide regardless. They were used for dates and sums, and when they ran out, somebody attached another sheet.

NOTES

1. The terms are given in Geert Rouwenhorst and William Goetzmann, “Infinity Has a Price”, Beinecke Rare Book and Manuscript Library, Yale University (reprinted in Yale Alumni Magazine), and in Yale News, “A living artifact from the Dutch Golden Age: Yale’s 367-year-old water bond still pays interest”, 22 September 2015. The Beinecke text names the cameraer and the canon and speaks of a 1,000-guilder contribution; Yale News gives the sum as 1,000 Carolus guilders of 20 stuivers each. I have not seen the full text of the bond, so the wording above is a summary of it. Yale News also gives the date of the bond as 15 May 1648; the description of the skin as vellum is the Beinecke’s, and I have not seen the full wording or the signatures.

2. The Beinecke article dates the paper addendum to 1943. Yale News says only that no space was left on the vellum, and one relay of it gave 1944, which I could not confirm. The essay says only that it happened in the 1940s.

3. Pliny the Elder, Natural History, book 13, on the invention of parchment at Pergamon in the rivalry between the kings of Pergamon and Egypt, citing Varro. The story is a legend and is told as one; the derivation of the Latin pergamena from the city is standard.

4. General knowledge of medieval colophons and marginal remarks by scribes about cold, bad ink and the hour; no single manuscript is cited. The statement about the Lek clerks rests on the published descriptions (Beinecke, Yale News), which mention only dates and sums.

5. Yale News, 22 September 2015, gives the bond as 1,000 Carolus guilders of 20 stuivers each. The gold Carolus guilder of 20 stuivers, struck from 1520 and named for Charles V, is given by a Dutch dictionary of coinage on dbnl.org.

6. Yale News, 22 September 2015: the library allows the addendum, not the bond, to travel to the Netherlands.

7. Yale News gives 136.20 euros, the Boston Globe 136 euros and the Beinecke article 132 euros. Twelve years at 11.35 euros come to 136.20. The annual yield of 11.35 euros is from Accountant.nl, September 2015, and Yale School of Management, 16 January 2026. Young’s account of the conference table and the cheque is as reported by Yale News.

8. Boston Globe, “Three centuries of compound interest, and counting”, 1 October 2015. Young’s remarks are reported there in direct speech, and the essay paraphrases them. The method of payment is given only by Gigazine, 3 October 2015, which reports a wire transfer.

9. Yale School of Management, “Prof. Rouwenhorst discusses Yale’s 378-year-old perpetual bond on BBC”, 16 January 2026.

10. Theo H. P. M. Thomassen, “The Peace of Münster: a national symbol in acid-free paper”, documentation of the exhibition project Westfälischer Friede, Landschaftsverband Westfalen-Lippe (lwl.org). Thomassen supplies the open doors and the crowd, the silver cross laid in a large Bible held by the priest of the Spanish embassy, the Spanish oath and the kiss, the Dutch raised fingers and the words “ainsi m’aide Dieu”, the king’s ratification signed “Yo el rey” with a solid gold seal, the red velvet casket with silver mountings, the comparison of the Spanish casket to a treasure chest and of the Dutch one to a large cigar box, and the proclamation from the steps on 16 May, which lasted for hours in three languages. The remark that the Spanish swore first is from the National Gallery, London, NG896. I found no source for bells or cannon at Münster and say nothing of them.

11. Rijksmuseum, Amsterdam, SK-C-1683, Gerard ter Borch, The Swearing of the Oath of Ratification of the Treaty of Münster, 15 May 1648. The museum’s description supplies the seating, the two copies of the treaty, the chests, the raised fingers and the names of Peñaranda and Pauw. The copper support and the self-portrait at the far left are as described for the version in the National Gallery, London (NG896); I have not checked whether the Rijksmuseum’s version differs.

12. General knowledge of the suspensions of payments by the Spanish crown: 1557, 1575, 1596, 1607, 1627 and 1647 (some lists add 1560 and 1653).

13. William Shakespeare, The Merchant of Venice, usually dated to about 1596 to 1598.

14. Pfeifer, article in De Zeventiende Eeuw 29 (2013), pp. 176 to 188, which gives Monday 22 March 1621, the soldier who sat on the chest and swung his feet against it, the maid's remark about porcelain and her reply that books carry spirit and are very much alive. The anecdotes rest on the maid's own account as set down by Brandt (a marginal note records that she told it in 1675), so they are tradition and not a contemporary record. The maid's name is spelt Houwening and Houweningen in Dutch sources. I could not read Pfeifer in full and rely on the fragments the search returned.

15. Rijksmuseum, print RP-P-OB-80.936, and Pfeifer give 22 March 1621. The sentence to life imprisonment and the plan of Maria van Reigersberch are from the University of Leiden web presentation on Grotius and from Maria van Reigersberch and Elselina van Houwening on Wikipedia, which cites Grotius's poem Silva ad Thuanum. The Leiden page gives 1619 for the escape, which is a slip.

16. Britannica, Today in History, 22 March: the guards noticed how heavy the chest was, and the Arminian exchange. I could not trace the exchange to a primary source, and Pfeifer's article does not contain it.

17. Hugo Grotius, The Rights of War and Peace, Book II, chapter XI ("On Promises"), sections I and IV, where a perfect promise is said to convey a right, and Book III, chapter XIX ("On Good Faith Between Enemies"), section I, which contains the sentence that a promise confers a new right of itself. I read the text on constitution.org, which carries an older English translation and not Tuck's edition, so the wording of the quoted phrase may differ in other editions. First published in Paris, 1625.

18. Rijksmuseum, Amsterdam, NG-KOG-1208, book chest possibly of Hugo Grotius: height 73 cm, width 160 cm, depth 75 cm, on loan from the Royal Antiquarian Society; the museum writes that the chest was long thought to be the one from the famous story. The Dutch heritage agency's catalogue entry on the search for the original chest names three candidates and does not identify it.

19. Stanford Encyclopedia of Philosophy, Hugo Grotius (archive edition of 2022): his last words at Rostock on 28 August 1645, "By attempting many things, I have accomplished nothing", are probably apocryphal. That he was Swedish ambassador in Paris is standard biography.

20. Stöver, article in the Bulletin of the KNOB (1994): the building was sold for 12,300 guilders on St Martin's Day, 11 November 1587; the demolition followed shortly afterwards; of the church nothing remained above ground except the school south of the tower. The saint is Martin of Tours, whose cloak legend is general knowledge.

21. Wikipedia, "St. Salvator's Church, Utrecht": one of five Catholic collegiate churches in Utrecht, founded by Willibrord's mission, demolished in 1587 and 1588 after Catholicism was outlawed in the Republic; the outline of its choir and transept can be seen in the paving of the Domplein. The page says nothing on the chapter after 1580. A review in BMGN, Low Countries Historical Review, of a study of the Oudmunster chapter notes that Catholic worship in Utrecht was stopped in 1580 and that the Protestant chapters were abolished only in 1811 by Napoleon; the study itself covers the canons to 1580. The bond's own description of de Meijer as canon of the Oudemunster is from the Beinecke article.

22. The same article by Stöver notes that the chapter was in the abbey of St Paul by 1623. A house history of Nieuwegracht 19 (Utrechts Monumentenfonds) says the abbey church was offered to the chapter in 1596 and demolished in 1706 as dilapidated.

23. Review in BMGN, Low Countries Historical Review, of a study of the Oudmunster chapter (the study covers the chapter to 1580): Catholic worship in Utrecht was stopped by the city authorities in 1580, and the chapters continued as Protestant bodies until 1811. This is a secondary summary and says nothing specific about 1648 or about Niclaes de Meijer.

24. Chantries Act of 1547 (Edward VI), which dissolved the chantries and colleges of England. The BMGN review is the source for the Utrecht chapters.

25. Dante Alighieri, Inferno, canto XVII: the usurers on the burning sand with purses hanging from their necks, each marked with a coat of arms.

26. J. H. Munro, "Rentes and the European 'Financial Revolution'", in Gerard Caprio (ed.), Handbook of Key Global Financial Markets, Institutions, and Infrastructure, vol. 1 (Oxford: Elsevier, 2013), pp. 235 to 249. Munro names the two forms erfelijkrenten (later losrenten) and lijfrenten.

27. Munro, "Rentes and the European 'Financial Revolution'", p. 239. Munro dates the declaration of Innocent IV to 1250 and 1251 and quotes the maxim in Latin; the essay gives it in English.

28. Munro, "Rentes and the European 'Financial Revolution'", p. 239. Munro states that buyers could never demand redemption, since that would have converted the rente into a loan, and that the right belonged to the issuer, who had to redeem at par. He describes this for the fifteenth century, and I use it here as background only. The papal bulls are those Munro cites for the fifteenth century.

29. Yale School of Management, 16 January 2026, where Rouwenhorst says the bond cannot be called. The comparison with the seller's right of redemption is my own.

30. Yale Alumni Magazine, reprinting the Beinecke article, which says the cribbing near Honswijk can be seen on satellite imagery.

31. NOS, 19 September 2024: the dyke broke on 31 December 1624 at Tull en 't Waal, near Houten, through drifting ice and high water, and was closed three months later. Other reports say January 1624 or late December. I have written around New Year and say so in the text.

32. Wikipedia, "Tull en 't Waal": 't Waal means a pool after a dyke breach and is first recorded in 1307 as Wale. I have not seen the 1307 record itself.

33. NPR, The Indicator, 13 December 2024 (transcript), and an NPR piece of 8 November 2023 for the woman in Amsterdam: Jeroen Haan on the water almost reaching Amsterdam and Rotterdam, about 40 kilometres away; the original buyer of the 1624 bond was a woman in Amsterdam; the bond is about 13 inches by 24 inches; "We still have to pay, and it's a great story" (paraphrased in the text).

34. The sum of 23,000 guilders and the date of 10 December 1624 are from the Financial Times account as repeated by Fortune, 15 December 2024, VRT, 19 September 2024, and DutchNews.nl, 11 December 2024. The sources place the breach on 31 December 1624 (NOS), at the end of December (VRT) or in January 1624 (DutchNews.nl); I could not resolve the dates and say so.

35. E-Sylum, volume 27, number 52 (numismatic newsletter), which cites a notice of 1938 that I have not seen, and NPR: Albert Andriesse, a board member of the Amsterdam exchange, bought the bond at auction and brought it to New York in 1938 as a token of friendship. Moderate reliability.

36. DutchNews.nl, 11 December 2024: the representatives collected about 300 euros in Utrecht and gave it to the museum in the village; the interest covered 22 years. Other reports give 299 and 360 euros, and I have used the round figure. Haan: "We know there are still seven bonds out there, and we know where five of them are." The annual interest is given as 13.64 euros there and as 13.61 euros by NPR; I use 13.61, which is 30 guilders at 2.20371.

37. David Hume to the Rev. George Campbell, 7 June 1762, letter 194 in J. Y. T. Greig, The Letters of David Hume (Oxford, 1932), quoted from a course reproduction (Pomona College) and from Alison Gopnik's article in Hume Studies. The Jesuit is not named in the letter, and I have named none. Hume lived at La Flèche from 1735 to 1737 according to Gopnik, who gives no day; other biographies say 1734. Hume's account of his stay is in "My Own Life" (1776).

38. David Hume, An Enquiry concerning Human Understanding, section X, "Of Miracles", part 1, where testimony is weighed by the number, character and agreement of the witnesses. The essay grew from the thought Hume says he had in

the cloisters, and was cut from the Treatise before publication (Peter Millican). The reading of the margin as testimony is my own.

39. David Hume, "My Own Life" (1776): he composed the Treatise first at Reims and chiefly at La Flèche, and it fell dead-born from the press. Book III appeared in November 1740, after Books I and II in 1739 (Millican).

40. Hume, Treatise, Book III, Part II, section 7, paragraph 8 (Norton and Norton numbering 3.2.7.8).

41. Mary Mapes Dodge, Hans Brinker, or The Silver Skates (New York, 1865), in which the tale of a boy who stopped a leak with his finger is told within the novel; the story is not widely known in the Netherlands. That the tale was little known in the Netherlands is a common remark in popular histories, which I have not traced to a scholarly source. Wikipedia notes that Dodge adapted an earlier French tale.

42. Dutch proverb "die het water deert, die het water keert", given in a teaching sheet of the water board Noorderzijlvest; Wikipedia, "Water board (Netherlands)", adds that inland residents often refused to contribute. I have not traced the rule to a primary source.

43. The Beinecke article says that the water boards could mobilise citizens into "dyke armies" in emergencies.

44. Heritage panels of the water authority Hoogheemraadschap De Stichtse Rijnlanden (HDSR): bells rang in the Lopikerwaard when the water reached a marked level, and the dyke army inspected the dyke on foot. The panels describe later practice and give different numbers for the army; they do not describe 1648.

45. Review in Bijdragen en Mededelingen betreffende de Geschiedenis der Nederlanden of the inventory of the archive of the water board (Rijksarchief Utrecht): the board was instituted in 1230, and until the end of the nineteenth century there was no permanent place for its archive. The Beinecke article gives 1323, which I could not confirm for this board. That the missing archive explains the lost records is my own inference.

46. Yale News, 22 September 2015: the bond is a bearer bond and the board kept no register of ownership.

47. Oscar Gelderblom and Joost Jonker, "Public Finance and Economic Growth: The Case of Holland in the Seventeenth Century", Journal of Economic History 71 (2011), (duty p. 8, debt ratio p. 12, the cut p. 16, moratorium p. 18, bill prices p. 20): the proposal of De Witt in 1652 to cut 5 to 4 per cent, shelved after an uproar; bills at 105 to 107 per cent of par in March 1655; the cut of August 1655 with a redemption fund; the ratio of debt to tax revenue; the payments of 1650 to 1653; private rates in 1655 and 1660. The register fee and transfer duty are from the same article. De Witt was appointed Grand Pensionary on 23 July 1653 (Britannica).

48. UK Parliament website on the fire of 16 October 1834, which began when the old Exchequer tally sticks were burned in the furnaces of the House of Lords; the Exchequer abolished the tally in 1826. The division into stock and foil is as in the Wikipedia article on the tally stick; the sources say furnaces.

49. Leviticus, chapter 25 (the fiftieth year: return of land, release of bondsmen); Aristotle and Plutarch on the seisachtheia of Solon, traditionally dated to about 594 BC.

50. DutchNews.nl, 11 December 2024, and Euronext, 19 September 2024: seven bonds known. Freeman's auction house, sale of 30 January 2020, lot 327: a bond of the Lekdijk Bovendams dated 1 May 1634, sold for 24,000 dollars against an estimate of 30,000 to 50,000. The bonds of 1638 and 1765 are held by Stichting Capital Amsterdam in the archive of the Amsterdam exchange. Yale News and the Beinecke article speak of about five survivors.

51. Euronext, press release of 19 September 2024: a 2.5 per cent loan of 1638 for 3,200 guilders and a 2.5 per cent loan of 1765 for 1,000 guilders, with a previous payment in March 2016. At 2.5 per cent for 386 years the total would be about 965 per cent, so the release implies higher rates earlier; I have not reconciled the figures. The release says nearly 1,500 per cent has been paid in interest since 1638 and does not say which of the two bonds it means. The phrase "symbol of the financial reliability of the Netherlands" translates the Dutch text.

52. Yale News, 22 September 2015 (5 per cent, cut to 3.5 and then 2.5 per cent during the seventeenth century); the Boston Globe, 1 October 2015. No source I found dates the cuts or says who agreed to them. The 1624 bond pays 13.61 euros on 1,200 guilders, which is 30 guilders at the conversion rate of 2.20371, or 2.5 per cent; one source claims 6.25 per cent at first, which I could not confirm.

53. Wikipedia, "Tiercering", for the default of 1808 and 1809 and the figures for 1809 (revenue about 33 million guilders, interest due about 39 million). That page gives 9 July 1810 for the decree, which is the date of the annexation. A Dutch journal of 1912 (De Tijdspiegel) dates the tiercering to 21 July 1810, and I have written only July 1810.

54. Geert Rouwenhorst and William Goetzmann, "Infinity Has a Price", Yale Alumni Magazine, March and April 2023: the board's finances allowed full payment of interest even in 1810, when the Netherlands defaulted on its sovereign obligations. I found no Dutch archival or scholarly source for the claim.

55. VRT, 19 September 2024: Yale bought the bond in 2003 for about 24,000 euros. Yale's own pages give no price, and the figure may be confused with the sale at Freeman's in 2020.

56. The figures are my own arithmetic. The share of the price carried by the first hundred years is one minus 1.05 to the power of minus 100, which is 0.9924. The share carried by payments after year 300 is 1.05 to the power of minus 300, which is 4.4 in ten million. The yield is 11.35 divided by 24,000, which is 0.047 per cent.

57. MacTutor History of Mathematics, Daxenberger project, chapter 4: the treatise was presented on 30 July 1671; the price of sixteen, the old price of twelve, the proposal of fourteen and the issue at fourteen in October 1671. The title in Dutch is Waerdye van lyf-renten naer proportie van los-renten. NN Group, "Life annuities in the 17th century", calls it the first mathematical approach to chance and probability applied to finance.

58. Gelderblom and Jonker (2011), pp. 18 to 20 as the pages appeared to me: in 1672 the States declared a moratorium on redemptions but not on interest, and bill prices fell to 30 per cent.

59. Haags Historisch Museum (haagshistorischmuseum.nl), page on the murder of the De Witt brothers: they were killed on 20 August 1672 after men stormed the Gevangenpoort; the bodies were hung at the Plaats and bystanders took body parts; Nicolaas Witsen kept Johan's tongue and a finger of Cornelis from 1672 to 1717.

60. Boston Globe, 1 October 2015, for Rouwenhorst's remark that Russia and the French government issued perpetuities and all at some point defaulted; Yale School of Management, 16 January 2026, for the word "miracle".

61. Yale News, 22 September 2015.

62. See the note on the evidence at the end.

63. HM Treasury, 3 December 2014: the repayment of the 3.5 per cent War Loan on 9 March 2015, £1.9 billion, its creation in 1932 by conversion of the 5 per cent war loan of 1917, more than 120,000 holders of whom 97,000 held less than £1,000 and almost 38,000 less than £100, and the Chancellor's remark. The slogan of 1932 is quoted on the blog of the registrar, Computershare. The reason, low interest rates, is from the government's announcement.

64. HM Treasury, 31 October 2014: the first repayment of an undated gilt in 67 years; some of the debt repaid in redeeming 4 per cent Consols dates back to the eighteenth century, to the capital stock of the South Sea Company originating in 1711, and to bonds first issued in 1752, converted by Goschen.

65. Federal Administrative Court, press release of 14 October 2025 on the partial decision of 1 October 2025 (the trigger of the contracts had not occurred and Article 5a of the emergency ordinance was unconstitutional in several respects; no remedy was ordered); FINMA, 15 October 2025, and UBS announced appeals; SRF, 10 December 2025, reports that the Federal Supreme Court gave the appeal suspensive effect. The latest report I found is from July 2026 and I found no ruling on the merits. The amount, about 16 billion francs, is given by SRF, swissinfo and UBS in slightly different forms. The decree of 19 March

2023, the figure of about 16 billion francs and the emergency ordinance of the Federal Council are as reported in these sources.

66. Creditincome Ltd. v. Swiss Confederation, United States Court of Appeals for the Second Circuit, No. 25-2733, decided 16 July 2026 (text on italaw.com): Switzerland, exercising its sovereign authority, coerced Credit Suisse into selling itself to UBS, and the brokering was not a commercial activity under the Foreign Sovereign Immunities Act. The court decided only the commercial-activity exception.

67. The remark that God made the world and the Dutch made Holland circulates as a Dutch saying and is often credited to Descartes in popular sources, none of which cites a text.

68. Hannah Arendt, The Human Condition (Chicago: University of Chicago Press, 1958), chapter V, sections 33 and 34.

A NOTE ON THE EVIDENCE

The essay rests on three kinds of statement, and the reader is entitled to know which is which. The first kind is documented: the date and sum of the bond, the bearer clause, the Münster ratification as Thomassen describes it, the Gelderblom and Jonker figures on Holland's debt, the British repayment and the Swiss and American rulings. The second kind is reported by one source only and should be read as such: the 24,000 euro price, the wire transfer, the payment of 1810, the gift of the bond of 1624 to New York in 1938, the dyke army, the water-board rule about harm, and the maid's account of the chest, which comes through a biographer who heard it in 1675. The third kind is my own inference and is marked as such in the text: that the rate was cut by agreement, that the board's creditors were harder to press than the state's, that the canon and the board shared a purpose in the form of the rent, and that the margin counts as testimony in Hume's sense.

Four things are unknown after the search. The date of the breach of 1624 and the date of the bond cannot be made to agree. The dates and authority of the rate cuts are recorded in no source I found. The full wording of the bond is not published in the sources I could read. What the title of canon meant for Niclaes de Meijer in 1648 is not stated anywhere I looked. The sources also disagree on the date of the allonge (1943 or 1944), on the payment of 2015 (136.20 or 132 euros), on the number of surviving bonds (five or seven). The Swiss litigation was pending at the latest report that I could find, and the status of any American petition is unknown.

PART I

VALUE

Value concerns how an object acquires meaning, and where that meaning goes once the price has been paid.

THE EMERALD THAT WAS GLASS

When a Story Becomes an Asset



Genoa Cathedral keeps, behind glass in its own treasury and rarely shown to the public, a shallow bowl with six sides, the colour of still, deep water. The chronicles place its arrival in 1101, carried home by Guglielmo Embriaco after the crusader fleet he commanded took Caesarea. Not long afterward Genoa settled the question of what the bowl actually was: a single emerald of a size no later age ever matched, and the very dish Christ had used at the Last Supper. For roughly seven hundred years the Republic treated both claims as established fact, which, for every practical purpose that mattered to Genoa, they were.

Legend did not stop at a precious stone. Across the medieval retellings the Catino slid, by stages, into identification with an older and larger story: the vessel of the Last Supper became, for some chroniclers, something grander again, the Holy Grail itself, the object later legend sent a continent of knights to search for. Genoa never had to choose which version it preferred. A city that had just helped take a Levantine port during the First Crusade was, by the conventions of the age, expected to come home with something of transcendent

value, and crusading fleets up and down the Mediterranean obliged with a steady traffic in relics whose documentation began, in nearly every case, with somebody's say-so and ended there. The Catino was simply a better specimen of a very common kind of object: unusually beautiful, usefully ambiguous, and entirely unverified.

A relic of that supposed magnitude did real work for a mercantile republic with no empire to speak of and a permanent need for credit. Genoa was a city of bankers and shipowners before it was anything else, and a shipowner's promise is only as good as what stands behind it when the ship is lost. Records survive of the Catino being pledged, in 1319, as security against a loan from Cardinal Luca Fieschi: an object sacred enough that no creditor would seize it carelessly, and valuable enough that no creditor needed to. The bowl spent most of its history seen rarely and believed completely, doing for the Republic's credit something close to what a gold reserve does for a currency: sitting still, saying nothing, and making everything built on top of it easier to trust.

Such an arrangement had exactly one weakness, and fire or theft could not reach it. Anything lost to fire, to theft, or to ordinary decay can be priced in advance, because an actuary can count how often such things happen to objects of a given kind. A claim about what an object actually is admits no such table. It survives for precisely as long as nobody with the standing, the motive, and the opportunity bothers to look closely, and for six hundred years in Genoa nobody who could look had any reason to.

That changed in 1806, when Napoleon, having annexed the old Republic along with the rest of Liguria, had the Catino sent to Paris with a quantity of other confiscated Italian treasure for his scholars to examine, men with no stake in Genoese prestige and no reason to flatter the find. They tested the bowl the way a conqueror's scholars test things, and reported back the only verdict that mattered: moulded glass, its one resemblance to an emerald being the colour.

Seven centuries of careful non-examination had just ended in a fairly ordinary afternoon's work.

Where the glass actually came from turned out to carry its own small argument. The attribution has shifted since, and has not settled: for a long stretch of scholarship it was called Islamic work, probably Fatimid Egyptian, from somewhere around the ninth or tenth century; Genoa's own cathedral museum today catalogues it instead as Roman, made in ancient Syria, closer to the first century. The two accounts cannot both be correct, and nobody currently writing on the subject claims to be sure which one is. The only point on which everyone has agreed since 1806 is the one Genoa would once have disputed to the death: it is glass, shaped in a mould by a skilled and perfectly ordinary craftsman, and an emerald is the one thing it has never been.

Returning from Paris, the dish broke, on 14 June 1816, somewhere on the cart track between the coast and the capital. The relic that had anchored a republic's credit for seven centuries came home cracked clean through.

Decades passed before conservators intervened properly; the metal band now holding the bowl together belongs to a later campaign of repair, one chapter in a sequence of conservation work that continued into the twenty-first century.

Credulity is too easy a reading here, and probably an unfair one. Six hundred years is a long time for an arrangement to go untested, simply because nobody who could test it had any reason to want the answer. The spell broke because power changed hands: a city that needed the Catino to be precious gave way to an emperor's court that needed only to know, precisely, what it had taken.

Expertise is no guarantee of disinterest. In 1937 the art historian Abraham Bredius, the most eminent Vermeer scholar of his generation, authenticated a painting called The Supper at Emmaus as a major early work by the master, and a Rotterdam museum paid handsomely on his word alone. The painting was the work of a struggling, resentful forger named Han van Meegeren, and Bredius's own eagerness was precisely what let it through: he wanted a new Vermeer to exist, badly enough that, for a decade, one did. Napoleon's scholars in Paris had wanted only an accurate catalogue entry from the Sacro Catino. Bredius wanted a discovery, and a claim is never safer than when the person testing it is hoping it turns out to be true.

Van Meegeren kept going. During the German occupation that followed, he sold a further forgery, Christ and the Adulteress, to Hermann Göring, passed off as a long-lost Vermeer. That one held up for exactly as long as nobody with both the expertise and the motive to doubt it was looking. After the war, Dutch investigators traced the painting back to van Meegeren and arrested him on a charge that carried the death penalty: selling a piece of the national patrimony to the enemy. His defence was that the patrimony in question was his own forgery, and proving a capital charge false required him to do something no forger ever wants to do twice, which was paint another one, under guard, while the court watched. He produced a third fake, Jesus Among the Doctors, over several weeks in 1945 in the presence of witnesses, and it convinced them. He was convicted of the far smaller crime of fraud instead. A story of this kind fails completely or not at all, in the one occasion somebody finally has both the standing and the reason to check it, having survived every day before that on nothing more than the absence of one or the other.

An entire modern industry now exists to manufacture, deliberately and for a fee, the scrutiny that Genoa received only by historical accident and Bredius failed to supply at all. Provenance researchers reconstruct a chain of ownership back to an object's creation, forensic laboratories date pigments, canvas weave and wood panels against what the period could actually have supplied, and the authentication boards attached to the estates of dead artists exist for the sole purpose of having no reason to want any particular answer. Between them they do for today's unique objects what Napoleon's scholars did for the Sacro Catino without meaning to: substitute a paid, disinterested doubt for the far more comfortable default, which is simply not looking, or looking with the answer already hoped for.

Insurers will price the fire and the theft without hesitation. The examination itself they generally leave to someone else, because there is no table of base rates for a secret that has simply never been tested.

The Catino is back in Genoa now, in its case, metal band and all, described accurately for the first time in its working life: a very old, well-travelled piece of glass, with a biography more interesting than its chemistry. That is a real kind of value, just a much smaller one than seven centuries of silence had assigned it. Somewhere in a treasury or a vault or a drawer not unlike the one that held the Catino for six hundred years, there is presumably another object earning its keep on exactly the same terms, examined by nobody, because nobody with the means to look has yet had a reason to. How would we know, this time, before somebody finally does?

JAN VAN EYCK WAS HERE

The Portrait and the Invention of Status



Whoever drew up the inventory of Margaret of Austria's pictures in 1516 faced a large panel and very little else to go on. The entry reads a large picture which is called Hernoul le Fin, and the list moves on. The painting was eighty-two years old by then. It had been made to show, down to the last orange, what its two sitters were worth, and somewhere between Bruges and Brussels it had lost the man's first name and wounded his last. Scholars have since decoded Hernoul le Fin as Arnolfini worn smooth by handling, the way a coin loses its king.

Oranges, anyway, survived. They lie about the room carelessly, in the National Gallery's phrase, and the Gallery adds that such fruit was extremely expensive. The bed is hung in red wool, the dearest piece of furniture in the house. The man wears a tabard of what is probably silk velvet trimmed with brown fur, and the woman a green wool gown with a long train, edged in white fur, which she gathers up in one hand as ladies commonly did. Visitors have drawn

conclusions from the way she holds it. The Gallery is firm on the subject: “She is not pregnant, though she might look it.”

Nothing in the room quite adds up. There is not enough space for the chandelier, no sign of a fireplace, the bed is too short and the mirror seems impossibly large. Van Eyck, the Gallery concludes, altered things to fit his aesthetic purposes and perhaps also to accord with Arnolfini’s aspirations. The infrared photographs add a small unkindness. The first Arnolfini had a larger face and even odder features, and on the second pass the painter improved his proportions.

The man paid for the velvet, and he paid for the face.

Above the mirror, on the plaster itself, the painter wrote Johannes de Eyck fuit hic, 1434. Jan van Eyck was here. Lorne Campbell’s catalogue calls it altogether exceptional for an artist to put his name on a wall, and for a good part of the twentieth century the sentence was read as a witness’s, because the picture was read as a wedding. The Gallery now says that it is no longer taken for one. He was there in a plainer sense as well: a thumbprint of his is still visible in the paint near the shadow of the dog’s leg, where he worked quickly and with his fingers. In the mirror, small and bent, two men come through a door that must stand behind the viewer. The Gallery asks whether they are van Eyck and a servant arriving on a visit, and the catalogue thinks the man in front, in blue, probably is. A painter who steps into his own picture to say that he saw the transaction is the oldest form of reference in commerce, and the least checked.

Giovanni di Nicolao Arnolfini of Lucca, if the Gallery is right to say probably, had been in Bruges since at least 1419 and sold silks, cloth of gold and tapestries to the court of Burgundy. In 1423 he sold Duke Philip the Good six tapestries of the life of the Virgin, which the Duke promptly forwarded to the Pope. He made what the catalogue calls disguised loans, to the town of Bruges in 1421 and to the Duke of Brabant four years later, and when a pair of Italian brothers named Sandei went bankrupt they owed him more than nine thousand ducats. His career was made of other men’s taste and other men’s debts. He went by Giannino, little Giovanni, at an age near forty, which the catalogue takes care to say is no sign of youth. Van Eyck painted him twice, and a second portrait of the same man, older, hangs in Berlin. The Gallery’s formal title still puts a question mark after his first name, and the identification has been less smooth than the velvet. From 1861 until the late 1990s the picture was assumed to show a cousin, Giovanni di Arrigo, and his wife Jeanne Cenami, until Jacques Paviot found that a Jehan Arnoulphin had been given silver pots by the Duke on his wedding in 1447, six years after the painter was dead, and the cousin’s claim did not recover.

His wife is the harder case. Giovanni di Nicolao’s only known wife, Costanza Trenta, whom he had married in 1426 when she was thirteen, is reported dead in a letter of February 1433. Campbell found no second wife anywhere in the records. The Gallery says the woman is probably his second wife, identity unknown, and Margaret Koster has proposed that the picture is a memorial, painted a year after the first one died. Nothing is certain except the gown.

Nobody knows how or when Don Diego de Guevara, who gave the picture to Margaret, came by it. By the next inventory, in 1523 or 1524, the clerk had it as Arnoult Fin, nearer than before and still not right, and the panel hung in Margaret’s private bedroom and study, with a marginal note recording a lock for its cover. It

passed to her niece, then to the kings of Spain, where a visitor in Madrid in 1599 copied out the verses on its frame and got the first line wrong. An inventory of 1661 mentions the verses too, and the Gallery quotes two lines from Ovid's Art of Love, which it translates as "In promises anyone can be rich." The frame has been replaced more than once and the inscriptions were probably not original, so the line was added by somebody who understood the picture rather well. A Scottish officer named James Hay tried to sell the picture to the Prince Regent in 1816 and failed, and a dealer later told a story of how Hay had come by it in Brussels. The Gallery calls the story romantic, which in a museum is a form of rebuke. Hay did sell it eventually, in 1842, to the National Gallery, whose adviser Mr Seguier was authorised to offer six hundred pounds, and on 2 May the trustees recommended the purchase for the moderate price. It became the Gallery's first Netherlandish painting.

Michael Spence won a Nobel prize in 2001 for working out why a degree, a brand or a famous name is worth buying: a signal is believed only when a bluffer cannot afford to send it. Arnolfini could afford it, and he had the Duke's own painter to do the sending. Since 1425 Van Eyck had been painter and valet de chambre to the Duke whose court bought Arnolfini's silks, and in 1435, the year after the picture, Philip converted his stipend into a life annuity and multiplied the sum. Bruges could hardly have offered a dearer witness than a man the Duke had pensioned for life. The oranges work in the same way, since anyone can say that he is rich and only a rich man leaves expensive fruit lying about. The merchant had no birth to show, and he bought the look of a man who had always been there, certified in a hand that everyone in the Netherlands knew.

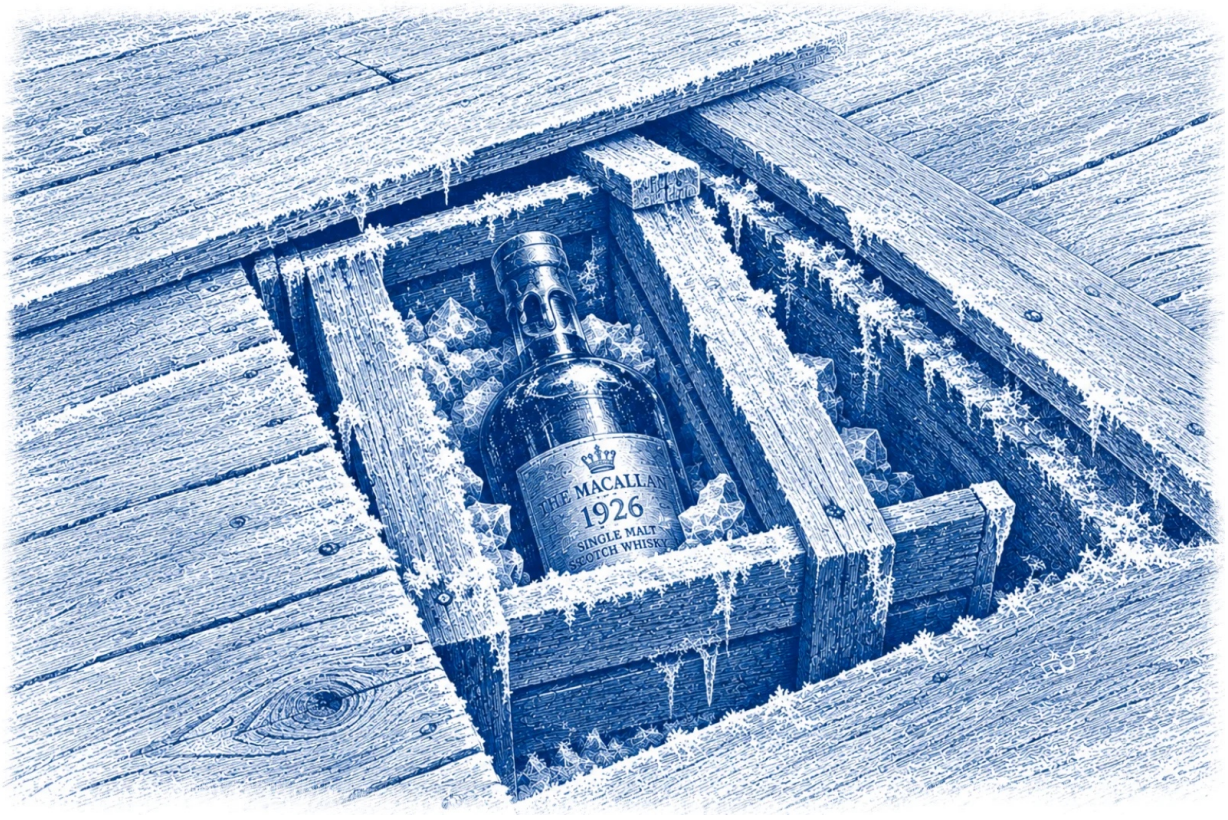
Van Eyck died in July 1441, and the Duke gave his widow a sum equal to a year's annuity. In 1442 Giovanni di Nicolao became a burgess of Bruges, for a moderate fee, after promising that he would no longer trade as a merchant, and was allowed the small crafts of a burgess, which he may never have practised. Campbell speaks of a mysterious reverse of fortune in the 1430s and wonders about the revolt of Bruges in 1437 and 1438. His last records show him arbitrating disputes among Lucchese merchants in 1446 and 1452, which suggests the community still trusted his word, if no longer his books. I would not like to be asked to prove that the witness's death and the merchant's withdrawal are connected. The dates simply sit side by side, like two guests who have not been introduced.

Still, the signature stayed where it was.

Among the things the infrared shows to have been added late, after the figures and the furniture had been settled, are the dog, the chandelier, the chair, the beads and the shoes. The shoes are a pair of wooden pattens, muddy, lying on the boards where the man stepped out of them. It seems that someone decided, at the last, that the house wanted a little of the street in it.

THE BOTTLE THAT WAS NEVER POURED

The Whisky Too Valuable to Drink



In 2006 a member of the Antarctic Heritage Trust, crawling beneath the floorboards of Ernest Shackleton's hut at Cape Royds, found wooden cases marked simply WHISKY. The stores belonged to the Nimrod expedition, which had spent the Antarctic winter of 1908 attempting to become the first party to reach the South Pole and turned back, in January 1909, some ninety-seven nautical miles short of it, having rationed al - most everything else along the way. The crates stayed exactly where they were found for four more years, frozen too deep into the ice to move. Only in 2010 did conservators finally work them free, revealing close to a dozen bottles inside, most of them still completely intact, their labels legible, their contents unspoiled by a century spent at the bottom of the world.

Nobody opened a bottle to find out how it tasted. In 2011 three of the intact bottles travelled to Scotland, where Whyte & Mackay's chief chemist, James Pryde, drew a sample through each cork with a syringe fine enough to leave the wax seal undisturbed. His analysis found a spirit built on Orkney peat and bottled at

forty-seven per cent alcohol, strong enough to stay liquid through a century in Antarctic ice without ever quite freezing solid. In January 2013 the bottles themselves flew south again, returned to the Antarctic Heritage Trust and the hut that had kept them, handled throughout with the caution a conservator gives a fragile manuscript.

Richard Paterson, the firm's master distiller, used Pryde's findings to recreate the vanished recipe from scratch, blending surviving stock from the long-closed Glen Mhor distillery with whisky from Dalmore, Benriach, Glenfarclas, Balblair, Pulteney and Jura until the chemistry matched. The result went on public sale in a wooden box marked with the name of the 1907 British Antarctic Expedition, a bottle anyone could buy and anyone could open. The explorers' own bottles kept their seals. The replicas, by design, did not.

Most valuable possessions tolerate being used. A painting can hang above a dinner table for a hundred years and still be sold at the end of it. A bond pays its coupon every six months and remains, afterwards, exactly as much of a bond as before. Even a classic car splits the difference less generously than either, since driving it hard enough, often enough, does erode its value, yet a single afternoon on the road costs only a fraction of what the car is worth, and the car survives to be driven again. A bottle of rare whisky offers no such instalment plan. The instant its seal breaks, the asset becomes an evening, and whatever pleasure that evening contains has been taken, permanently, out of the bottle's price.

Sotheby's put a number on that trade-off in November 2023, when a bottle from the Macallan's 1926 vintage, one of just twelve ever to carry a label the artist Valerio Adami painted for that batch of forty, sold in London for £2,187,500, comfortably clearing a pre-sale estimate of £750,000 to £1.2 million and setting a new record for any bottle of spirits or wine ever sold at auction. Barely ten Adami-labelled bottles are thought to survive intact. Whoever paid the record price bought a liquid whose value depends entirely on staying exactly where it was.

When Knight Frank added rare whisky to its Luxury Investment Index in 2019, the category immediately overtook classic cars as the index's own former champion, posting a reported rise of close to six hundred per cent over the preceding decade. That curve is made almost entirely of other people's ordinary evenings, repeated by the thousand, year after year, each one worth nothing to an index and everything to the two people at the table.

An asset class this size has grown its own supporting trade. Specialist insurers now underwrite climate-controlled vaults built solely for bottles, and authentication has become a profession in itself, because a market built on six-figure sums for ninety-year-old glass has inevitably attracted forgers filling ordinary bottles with ordinary whisky and ageing the labels by hand. Scientists at Scotland's SUERC laboratory have even turned nuclear weapons testing to the trade's advantage, reading the radiocarbon signature that fallout left in the atmosphere through the 1950s and 1960s to date a whisky's true distillation year; one 2018 survey of fifty-five supposedly antique bottles found twenty-one of them, collectively valued at around £635,000, to be outright fakes or simply misdated. Buyers at this level pay, in effect, for someone else's certainty as much as for the whisky, a cost no drinker worries about over an ordinary dinner.

Ordinary scarcity is a fact about supply: a mine runs dry, a print run ends, a species dwindles. This scarcity instead tracks a fact about other people's evenings. The number of surviving bottles falls every time an owner, somewhere, decides that a wedding or a promotion is worth opening one, and pulls the cork.

This arrangement, looked at honestly, recruits an enormous unpaid workforce. Every drinker who opens one of the surviving bottles is, without being asked and without being paid, doing exactly the job a central bank does when it retires old currency: reducing the stock still in circulation and, by doing so, raising the value of what remains in somebody else's safe. The collector who never pours a drop is the arrangement's only beneficiary, and its only member who contributes nothing to the scarcity he profits from.

Economists have a name for goods whose value rises the more conspicuously they are consumed, a diamond watch, a sports car driven loudly through the middle of town. Rare whisky inverts the logic without breaking it. Value here rises with conspicuous non-consumption instead, a public, verifiable record of a bottle sitting untouched in a vault year after year, its restraint advertised rather than hidden. Thorstein Veblen never wrote the chapter for an asset that gets more valuable by doing absolutely nothing, though he would almost certainly have recognised the species on sight.

Distillers, for their part, have no stake in any of this. Whisky is made to be drunk, matured specifically so that it eventually tastes of something worth drinking, and a cask is a cost on a balance sheet until the day it is bottled and sold. A buyer's own choice afterwards, make the bottle somebody's Tuesday or somebody's inheritance, has never been the distiller's business, and still is not.

A pension fund defers a payment that will eventually reach someone; a whisky collector defers a pleasure that, left alone for long enough, reaches no one at all. The point of holding the bottle, by then, has very little to do with the whisky.

That record price carries its own evidence, worth naming plainly: nothing more than patience, maintained slightly longer than anyone else's. The spirit inside is exactly as good as it was the day it was bottled, since whisky stops ageing the moment it leaves the wood. The remaining pool it is being measured against has simply thinned, year after year, as other bottles from the same 1926 vintage disappeared one by one into somebody's dinner party.

Shackleton's own crates remain the purest version of this logic, stripped even of the pretence of an eventual sale. No one involved in a decade of handling them has ever suggested pouring a glass. A syringe through a cork was already judged more invasive than the moment strictly required. By the time those cases finally came free of the ice, the expedition they represented, a vanished age of polar ambition, a hut kept exactly as its last occupants left it, had grown far larger in anyone's imagination than anything the liquid itself could still deliver on a palate.

Their value, at this point, is entirely custodial. They are kept the way a reliquary is kept, which is to say precisely because nobody intends to find out what is actually inside.

The whole scheme depends on staying a minority taste. If every owner of a rare bottle adopted the collector's discipline at once, scarcity would stop rising, since nothing would ever again be subtracted from the pool, and the price would settle, static and ordinary, like any other finite stock sitting quietly in a warehouse.

The collector's advantage survives only because almost everyone else, reasonably, prefers an evening to an asset, and keeps on proving it, one open bottle at a time.

Somewhere tonight, in a city the collector will never visit, a stranger is choosing a special bottle for an anniversary, a homecoming, an excuse invented on the spot because the week has earned it, with no thought at all for Scotland, Antarctica or auction prices. The stranger pours, toasts and feels nothing about markets whatsoever. Several thousand miles away, in a safe or a vault or a climate-controlled case, somebody's unopened shelf has just become very slightly more valuable, and its owner will almost certainly never learn the stranger's name, let alone thank him for it.

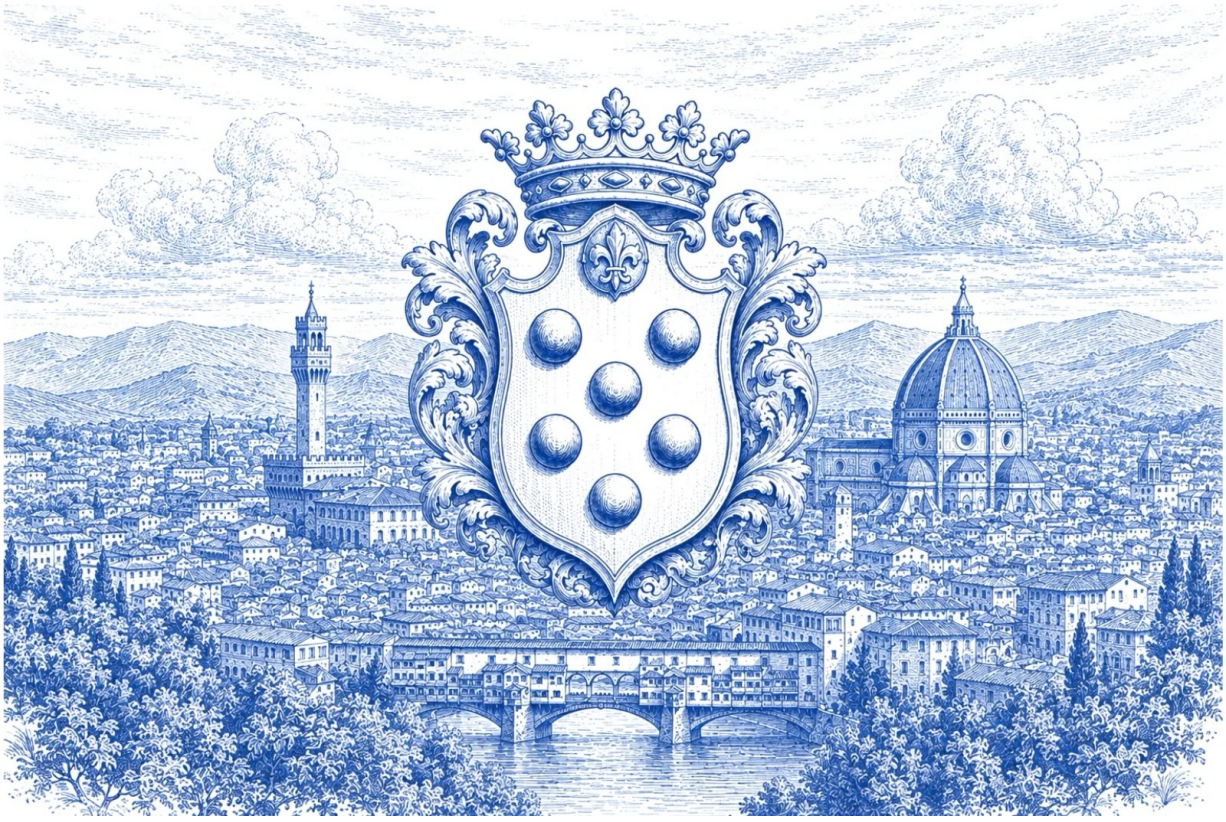
PART II

CAPITAL

Capital concerns what ownership permits a person to do, what it obliges him to do, and why the instruments that build a fortune so often threaten its survival.

THE BANKERS WHO BOUGHT A RENAISSANCE

Wealth Is Not Money



"Item, a house in the parish of San Tommaso, with a garden and a well."

A line of that kind is what the Florentine catasto returns are made of, page after page, from the year 1427 onwards, when the commune required every household in its territory to declare what it held, what was owed to it, and what it owed to others. Giovanni di Bicci de' Medici filed his, as everyone did. Property was itemised, debts deducted, and a figure emerged at the bottom against which the household would be taxed. The instrument was, for its century, an administrative marvel. It was also nearly useless as a measure of the thing it was built to measure, and the family that would spend the next hundred years demonstrating why filed the most careful returns of anyone.

Raymond de Roover, who worked through the bank's own surviving books more thoroughly than anyone before or since, reached a conclusion about those declarations that deserves to be better known: as evidence of Medici wealth they cannot be trusted, because the principals misdeclared. Not crudely. A tax return of this period is not a confession but an argument, and the Medici argued better than most, with lawyers to help them and assessment committees composed of men who had their own returns to file. The commune accepted what was convenient to accept. Everyone involved understood the genre.

Consider what the bank actually was, since the romance around the name tends to obscure a sober and rather beautiful structure. In practice it functioned as a partnership of partnerships, headquartered in Florence from 1397, when Giovanni moved his operation up from Rome, with houses in Rome, Venice, Geneva, Bruges, London and elsewhere, each of them a legally separate company in which the Florentine centre held a controlling share alongside a local manager who put in capital of his own and drew a fixed portion of the profits. A branch that failed could fail alone. The manager, with his own money in the venture, had reason to be careful with everybody else's, and the surviving correspondence shows a head office issuing instructions about credit limits which the branches did not always trouble to obey.

The most profitable business, year after year, was exchange, a line of work that never touched interest in any form a canon lawyer would have been obliged to notice. A bill drawn in Florence and payable in London in sterling some weeks hence carried its profit inside the rate itself, with no stated charge anywhere for the passage of time, which satisfied the theologians, the notaries and very nearly everybody else. Time was being sold. It was simply not being invoiced.

Cosimo, Giovanni's son, understood early that the largest single account on the books was the papacy's, and that keeping it depended on his standing in Rome, which depended on his standing in Florence, which depended in turn on taxes he preferred not to pay and offices he declined to hold. He held no permanent magistracy worth the name. He arranged instead that the men who did hold them should be men who owed him money, or owed him a chapel, or owed him the marriage their daughter had made. The republic's forms were left entirely intact. Nobody had to be deceived, because nobody had to be told.

At this point the accounting gives out. A bill of exchange is an asset because a named party will honour it and a court will assist if he does not; it can be discounted, pledged, sold to a third house at a price. A chapel endowed in a rival's parish is an asset because the rival's son will find it awkward to speak against you in the Signoria, and no court anywhere will assist you if he manages it regardless. The second thing cannot be transferred, cannot be liquidated, yields no income, and requires continuous expenditure that looks on any ledger like waste. What it does is lower the price of everything you subsequently attempt. Modern practice has a shelf for such an item and it fits badly: an intangible of indeterminate useful life, carried at cost, tested for impairment only when something has visibly gone wrong. The cost is knowable. The value is not. And the impairment, when it arrives, arrives everywhere at once, because the whole position was one position.

Cosimo's obligations were worth what they were worth precisely because they were not for sale. This is a real form of wealth and it behaves nothing like the other kind. It is more durable across a century and far more fragile across a bad six months, and the difference will not appear in any return either man filed.

Lorenzo found out which six months.

What he inherited was the reputation. The ledger was another matter, and his considerable talents lay elsewhere entirely. The papal account went. The northern branches had written large loans to princes who could not be sued and were slow to admit what that meant. Public funds administered by his allies covered private shortfalls, a manoeuvre available only to a man whose obligations were in excellent order and ruinous to a man whose cash was not. The Pazzi came for him in the cathedral in 1478, and his brother Giuliano died on the floor of the Duomo. The conspiracy failed, which mattered less than it appeared to, since the bank went on failing more slowly. By 1494 the family was out of Florence and, by the reconstruction de Roover offers, in debt to its own Rome branch.

Art stayed. Buildings stayed. Two popes and a grand ducal dynasty came afterwards, and the capital that made them possible was by then in no branch's books at all, which is the part I cannot resolve. Did Cosimo know what he was doing, in the sense of having a view about which of his two fortunes would outlast him, or did the durable one simply turn out to be the residue of a lifetime of expenditure he undertook for reasons of piety and vanity and Florentine habit? The letters show the chapels commissioned and the sums paid. They do not show a man reckoning the exchange rate between liquid claims and illiquid standing, and I doubt such a reckoning was ever written down, because the men who were best at it had no need to write it down at all.

A single detail argues for the intention. The sacristy, the library, the friars' cells, the chapel walls: the family put its name and its emblems into places where the name could not be painted out without insulting God, and it did so in a city where political exile was routine and property confiscation ordinary. A palace can be seized. A convent cannot easily be un-endowed. Whoever chose those particular vehicles for that particular money was thinking about a horizon longer than a branch's fiscal year, and the choice looks, at this distance, uncomfortably like a portfolio decision.

Genuine rigour went into the catasto of 1427, measuring the part of a Florentine fortune that consisted of items. It is the only surviving systematic measurement of Medici wealth, and the family's whole achievement lay in the column it did not have.

One is tempted to say they turned money into culture. They did something narrower and stranger. They converted liquid claims into illiquid obligations at a rate nobody quoted, on a market that ran in one direction only, and the conversion was not reversible on any terms at all, which is why, in the year they needed cash, the wealth was still entirely there and entirely out of reach.

THE LUXURY THAT FACED INWARDS

Why Wealth Hides



A magistrate of Venice's Provveditori sopra le Pompe stops a woman at the foot of the Rialto steps, some - time in the middle of the sixteenth century, and does the one thing his office exists to let him do: he looks at her sleeves, in daylight, in the open street, the only place his authority actually reaches. He can measure their width against the figure the Republic has fixed by statute. He can count, or try to count, the pearls sewn along her bodice. A small crowd gathers for this sort of thing, the way a crowd gathers for any public reckon - ing, and the woman stands still and lets herself be counted, because refusing would cost her more than the fine ever could. He cannot ask her to turn out her coat.

Venice legislated against its own citizens' wardrobes across nearly three hundred years, an unusually long run for any single piece of social engineering. The Republic fixed how wide a sleeve could be, how many pearls could show on a bodice, how many courses a family could set down at a wedding feast, and in 1514 it gave the job of enforcing all this to a standing magistracy built for the purpose. That magistracy then reissued its own

statutes, with adjustments, roughly once a generation for as long as the Republic lasted. Older historians read the reissuing as about as clear a signal as history offers that the laws were badly kept: a rule rewritten every few decades, on this account, is a rule nobody much respected the first time. More recent scholarship is less certain, and has a point worth taking seriously. A law revised periodically can just as easily mean routine housekeeping, or fashion outrunning the previous generation's categories, as outright defiance; reissuing is the kind of evidence that fits several different stories equally well, and a historian being honest about the sources says so.

Enforcement could cut in strange directions. Venetian law at various points reserved certain fabrics and jewels for courtesans, and by one well-known reading did so precisely because a patrician wife was supposed to be seen as modest; the surviving statutes are thin enough, and the scholarship built on them contested enough, that other historians read the privilege running the other way entirely. What several historians of the period do agree on is the result: patrician women are recorded dressing deliberately to resemble what the statute permitted a courtesan to wear, envy running upward, for once, toward a class the law was supposed to rank beneath the wife.

The statutes could reach only as far as a magistrate could actually see, and a magistrate stands in the street. An exterior can be inspected there; a lining cannot. Venetian tailors understood this before the ink on any given statute had dried, and the same fur, the same figured silk, the same banned extravagance migrated inward: into a sleeve turned back at the wrist for a moment, a hem that showed only when a woman stepped out of a gondola and had to gather her skirt, or a coat lining nobody but a maid or a husband would ever be positioned to examine. The total expenditure probably went on exactly as before. Only its address changed.

That same logic built the city's houses. Behind a restrained Gothic or classical facade, a Venetian palazzo ran to painted ceilings, gilded stucco, rooms no passing gondola could see into from the canal. The family's serious money, in any case, lived mostly in shares of a trading voyage to the Levant, or in the Republic's own public debt fund, the Monte. The Monte was a forced loan the state had levied on its wealthier citizens since the thirteenth century, and never entirely stopped collecting in one form or another. Upstairs, the gilded stucco stayed exactly what it looked like. By the sixteenth century, holding a share of the state's own debt was simply what a prudent Venetian fortune did with its surplus: indistinguishable, on the building's face, from money kept under a mattress, and paying interest that a mattress never would. A visitor arriving by water saw a door, a watergate, perhaps a coat of arms. The portfolio, such as it was, stayed indoors, in a form no sumptuary law had ever been drafted to regulate, because no magistrate could point to it.

Modern wealth keeps the same architecture and has simply changed tailors. The holding company, the family trust, the unlisted fund, the arrangement structured across two or three jurisdictions: each one achieves exactly what the Venetian lining achieved, a gap between what a fortune actually is and what anyone standing in front of its owner can see, with no magistrate anywhere in the picture left to deceive. Visibility has simply become a liability nobody needs a statute to explain. A fortune that can be seen can be sued, taxed with more precision, targeted by a kidnapper, or added to one of the public rankings that exist for the sole purpose of being read. A fortune nobody can quite locate is spared most of that, at a real and continuing cost in liquidity, in simplicity, and occasionally in the owner's own clear view of what he actually holds. Today's equivalent of

the magistrate at the foot of the steps is a tax inspector, able to request a filing yet powerless to compel a structure into simplifying itself, and the same old gap reopens between what the rule can reach and what the fortune actually is.

Economists have actually tried to size this, even though the precise figure moves with the methodology used to produce it. Gabriel Zucman, working through the gap between the world's recorded cross-border assets and its recorded cross-border liabilities, arrived at an estimate running into the trillions of dollars for household wealth held in structures built specifically to obscure who actually owns them, concentrated in a short list of jurisdictions that compete openly on exactly that service. Nobody claims the figure is precise, Zucman least of all, though almost nobody disputes the direction it points. A meaningful share of the world's largest fortunes sits in a form designed, deliberately and from the outset, to be invisible to the tax authority, the court, and the curious neighbour alike.

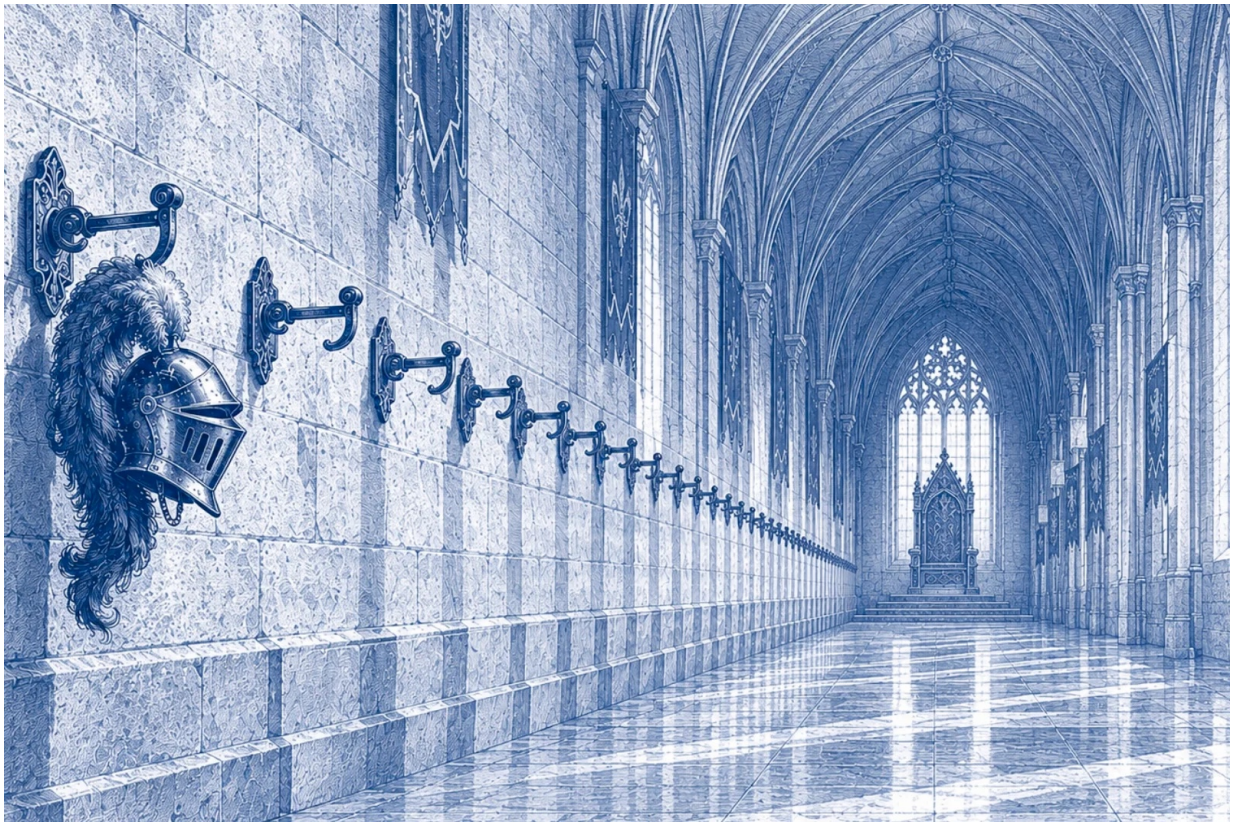
Comfort is not always the motive. Communities who have learned, over a long enough history, that visible wealth draws confiscation as reliably as it draws admiration, have tended to convert what they can into forms a border guard or a mob cannot easily find: a jewel sewn into a hem, a bill of exchange payable in another city, a deposit in a bank two kingdoms away. Discretion of this kind is less a strategy for growing richer than one for staying whatever rich one already is, through an event nobody wants to name out loud while they plan for it.

There is a neat piece of evidence for how far this logic runs, and it survived purely by accident. In 1912, workmen demolishing a building on Cheapside, in the City of London, broke into a wooden box buried beneath the cellar floor and found what is now called the Cheapside Hoard: several hundred pieces of jewellery, gemstones and watch parts, dated mostly to the early sixteen-hundreds, including stones that had travelled from as far as Colombia. It was most likely a jeweller's working stock, though a private collector's cache remains a live alternative reading. Whoever buried it did so during the upheavals of the English Civil War and never came back, for reasons nobody now knows. It is one of the largest caches of its period's jewellery to survive anywhere, and not one piece of it was ever worn in public as far as any record shows. The common assumption runs the other way, that what fills a museum case today must be what people once wore and were seen in. The Cheapside Hoard argues for close to the opposite reading. Displayed jewellery gets reset for new fashions, pawned in hard years, melted for its metal, stolen, or simply worn thin. Hidden jewellery has only one enemy, which is somebody forgetting where it is, and Cheapside's owner did exactly that favour to the twentieth century without meaning to. Discretion, unglamorously, turned out to be one of the better preservation strategies available.

None of this would have surprised the magistrate at the foot of the Rialto steps, if anyone had cared to explain it to him, though explaining it was never his job. His statute reached as far as the eye, and stopped exactly where the eye did. He could fine a sleeve. He could not fine a lining, a ledger entry, or a box buried under a cellar floor three hundred years before anyone thought to dig there, and nothing in three centuries of reissued statutes ever closed that gap, because no statute can. Status still sells itself through display. Keeping anything worth having sells itself through the opposite, and a family's wardrobe has always told you less about its wealth than its lining would.

THE HUNDRED KNIGHTS

Transferring Capital Without Transferring Wisdom



At the opening of King Lear, an ageing king stages a contest. Each of his three daughters must declare, in front of the whole court, how much she loves him, and the size of her inheritance will be measured against the performance. Cordelia, the youngest and the one who actually loves him, refuses to perform and is disinherited on the spot. Her two sisters, who perform beautifully and mean rather less of it, divide the kingdom between them. Lear keeps, for himself, the royal title and a personal retinue of a hundred knights. Shakespeare wrote the scene around 1605, borrowing from an older, half-legendary chronicle of a British king, but the mechanics of what happens in it have not aged a single day.

The transfer itself goes perfectly. No court challenges the division, no daughter contests her share, and the land changes hands exactly as the old king intended. The scene's real failure lies elsewhere entirely: in Lear's own judgement about which daughter actually loved him, a judgement that turns out to have been exactly backwards, and no will or deed anywhere in the play was ever going to catch that mistake before the ink dried.

Erosion follows the division almost immediately, quiet and procedural, which is exactly what makes it so recognisable to anyone who has watched a family argue about money. A hundred knights becomes fifty within a single conversation. Fifty becomes a smaller number Lear is invited to name himself, and then a smaller one still, until Regan finally asks what need he has of even one. Lear's own answer survives in four words: "O, reason not the need." Goneril and Regan frame each cut as simple housekeeping, a houseful of armed men causes friction with their own staff, and fifty, or twenty-five, or none, are plenty for a man his age. Whether this is cruelty dressed as prudence, or prudence that happens to look cruel from the outside, the play pointedly declines to settle, which is part of why the scene still unsettles audiences four centuries later.

A modern trust can be built to hand over money gradually, releasing a portion when a beneficiary turns twenty-five and the remainder a decade later, rather than resting the whole fortune on one old man's say-so, decided in a single afternoon. Lawyers can wall that money off from a future creditor, a messy divorce, a bad decade in the markets, or, more delicately, from the beneficiary's own worst night out. Dynasty trusts in a handful of jurisdictions can now run for several centuries, layering spendthrift clauses and independent trustees between the money and any single beneficiary's worst impulse. None of this was available to a Jacobean king working from loyalty and improvisation alone, and the comparison genuinely flatters the modern structure.

No clause in any of these structures, however, can hand over the one asset that actually built the fortune being protected: judgement, acquired the only way judgement is ever acquired, by paying personally for a specific mistake. A bad partner, a loan that should never have been signed, a decade spent recovering from a single hard winter, each of these teaches restraint precisely by hurting, and a well-designed trust exists, among other things, to make sure the next generation never has to feel that particular kind of hurt.

Lear had held power, and presumably exercised judgement, for decades before the play's first scene, which rules out any excuse of youth or inexperience. The judgement that failed him was narrow and specific: reading sincerity in a performance staged entirely for his own benefit, by people with every incentive to get the performance right. Four decades spent ruling a kingdom, it turns out, builds no particular skill at the one afternoon when a daughter is lying to your face for an inheritance.

English speakers have had a name for the wider pattern since at least 1874, when an essayist wrote that America allows but three generations from shirtsleeves to shirtsleeves: the first generation builds a fortune through its own hard labour, the second enjoys it without quite remembering how it was built, and the third returns to the shirtsleeves the first generation started in. Lancashire kept its own version of the same observation, clogs to clogs, three generations, which suggests the pattern was never a uniquely American vice. A five-character Chinese proverb carries the identical warning back further still: fu bu guo san dai, wealth does not survive three generations.

John D. Rockefeller Jr. tried to engineer the missing lesson on purpose, requiring each of his six children to keep a written ledger of every allowance they received, tied to chores actually performed, and insisting that two-thirds of it be saved or given away before a penny was spent. The sums involved were trivial next to the Rockefeller fortune itself. The habit they were meant to install was not.

Warren Buffett has made the opposite calculation, in public, more than once. His own stated formula is to leave children enough so they can do anything but not enough that they can do nothing. The sum he actually

intends to pass on directly is a small fraction of his fortune. The bulk of it goes to philanthropic foundations, administered in part by those same children, and administering a foundation for decades is its own long apprenticeship in judgement, which a single inherited cheque never has the chance to teach.

Lottery winners run the purest version of the same experiment, performed at random on thousands of strangers: hand someone the money without the years of smaller decisions that would have earned it, and the money routinely outruns whatever judgement was supposed to be managing it. Competence with money, like competence at most things, seems to arrive only by making decisions about it and living with whatever the decisions cost, practice that a lump sum simply skips over.

More careful family offices now build real governance around the money itself: regular sit-downs that tackle actual disagreements, and a deliberate willingness to let a young heir lose a modest, survivable sum on his own bad decision while he is still twenty-two and the number involved would embarrass nobody. A costly mistake made early, while it is still small enough to absorb, buys a family roughly the same education Lear's own money never had to pay for. Made for the first time at fifty, with the family's full capital behind it, the identical mistake buys only a crisis and a board meeting.

Lear's own lawyers, if the play had employed any, would have had nothing whatsoever to reproach themselves for. Every acre reached the daughter it was promised to. Every clause did exactly what it said on the parchment. The one piece of information that actually mattered that week, which daughter could be trusted, and why Lear had got it backwards, reached no jurisdiction's clause-drafters at all, because no clause has ever been written to carry that kind of cargo.

Property, in this sense, travels remarkably easily. It is divisible, documentable, and enforceable down to the last acre or the last basis point, and a competent lawyer can move it precisely where a client directs. What a client has actually learned, about himself, about his children, about which of them can be trusted with money and which cannot, travels the way a childhood language travels: slowly, informally, and only to whoever happened to be in the room while it was being learned the hard way.

Families that get this right tend to share one habit that no clause can replicate: they let the next generation make genuine decisions, with survivable consequences, well before any real money is at stake. A teenager given a small trading account and permission to lose all of it learns something about risk that no seminar, however well catered, can substitute for. A thirty-five-year-old receiving his first unsupervised distribution from a trust, with no prior practice at losing anything smaller, is being handed a live exam in a subject he has never once been allowed to fail. None of this requires a fortune on Lear's own scale. The principle holds just as well for a family business worth a few million as for one worth a few billion, since the asset actually being protected, in both cases, is the same fragile and non-transferable thing.

In a house with far less at stake than a kingdom, a father is watching his twenty-two-year-old lose four hundred pounds this week on a transparently bad investment, and is, with some effort, saying nothing at all. He has the money to cover the loss twice over, and the sense to know that covering it would be the single most expensive mistake available to him. His son will remember the four hundred pounds for the rest of his life. A decision made for him by someone else, however carefully drafted into whatever clause eventually reaches him, leaves no memory behind at all.

PART III

TIME

Time treats the future as something that can be bought and borrowed against, until compounding reaches the edge of a finite life.

FRANKLIN'S TWO-HUNDRED-YEAR EXPERIMENT

What Endures Eventually Multiplies



Franklin sat down in June 1789, roughly a year before he died, and added a codicil to a will already written, the sort of thing a man adds when something has occurred to him since, and it is not a short document. It sets aside a thousand pounds sterling to Boston and a thousand to Philadelphia, and then it does something a testator almost never does: it explains, at length and with evident pleasure, the reasoning behind the sum. The money was to be lent in small amounts, at five percent, to young married artificers who had served an apprenticeship and could produce two respectable sureties. After a hundred years each city might spend a portion on public works. After two hundred, the remainder fell to the city and the state, and the arrangement ended. It is a document a modern trust lawyer would recognise on sight: a defined corpus, a narrow class of eligible beneficiary, an investment mandate confined to a single kind of loan, and two hard distribution dates fixed in the instrument itself, with no room left for a trustee's later discretion.

He had run the arithmetic himself and put the answer in the document: a hundred thousand pounds at the first century mark, something over four million at the second. Compound interest, one must admit, performed exactly as instructed on the page.

This design deserves more admiration than the punchline usually allows it. Franklin's real achievement was compounding a class of borrower, a rather more ambitious project than simply compounding money. The loans went to tradesmen at the beginning of their working lives, at a rate below what a private lender would ask, secured by the reputation of two neighbours in place of the property the young man did not have. The fund was a credit institution aimed at people no credit institution wanted, and its collateral was standing in the community. He had been such a young man himself: a runaway printer's apprentice who reached Philadelphia without enough capital to set up a shop of his own, backed into his first press by other men willing to vouch for a stranger, and the codicil reads like an old debt being repaid to a creditor long past collecting it.

Two centuries before economists gave it a name, this was peer guarantee in place of collateral: a borrower vouched for by people who knew him instead of property he could forfeit. Modern microfinance rediscovered the same substitution in villages that had no Franklin and no codicil, and rediscovered too that it depends entirely on the community doing the vouching staying intact. Muhammad Yunus built an entire institution on it two centuries later in Bangladesh. Grameen Bank lent to borrowing groups who vouched for one another, with no collateral anywhere in the transaction, and the Nobel committee gave Yunus and the bank its 2006 prize in the peace category, an early hint at how the innovation would eventually be classified in the literature.

What happened afterwards is where the two cities part company, and the difference is the whole of the lesson. Franklin never says why the bequest went to two cities and not one; the effect, whatever the intention, was a controlled experiment: identical terms handed to two different sets of trustees, with two centuries allowed to show what trusteeship adds to arithmetic.

Boston's fund found, within a generation, that its intended borrowers were disappearing. Apprenticeship as an institution was dissolving; the young artificer with two sureties and a trade of his own was becoming a wage-earner in somebody else's manufactory, and there was no longer a queue at the door asking for five percent against a neighbour's word. Boston's trustees, left with an emptying applicant pool and a document that named no alternative, did the conservative thing available to a fiduciary holding idle money: they moved it into savings banks and other securities, an investment the codicil had not contemplated and, read narrowly, had not forbidden either.

Philadelphia took a different course. Its trustees read the borrower requirements more loosely as fewer qualifying applicants presented themselves, and the fund kept lending against a shrinking pool of them. It recovered less. By the middle of the nineteenth century its books carried a long tail of loans nobody was ever going to collect, made to men whose sureties had died, moved away, or simply stopped answering. Both cities eventually litigated, and both went to court over whether the hundred-year disbursement could be spent on one purpose or another that Franklin had never enumerated; courts, faced with a dead man's instructions and a living city's

preferences, did what courts do with instructions that have outlived their world. They construed them generously.

When the two hundred years closed in 1990, Boston's share stood at something in the region of five million dollars and Philadelphia's at rather over two, against the four million sterling the codicil had forecast for each. The gap is not small. It is also not, as the tidy version has it, a story of theft.

None of this shows up in the arithmetic. The shortfall went into loans excused because a tradesman's shop had burned, into terms softened during a panic, into a trust managed by men who had also a bank to run and a war to finance and could not reasonably be expected to treat a bequest from the last century as their first obligation, and not one penny of it into anybody's pocket. Every one of those decisions was defensible in the room where it was taken. The curve simply cannot distinguish between a percentage point lost to embezzlement and a percentage point lost to mercy, and over two hundred years the second is far more common than the first.

Compound interest requires no virtue whatsoever, per definition. That is its great administrative beauty and the reason it is the only financial mechanism that genuinely works unsupervised: it needs only an absence, the absence of any hand reaching in. An institution staffed by human beings across seven or eight generations requires virtue continuously, from strangers, with nothing to enforce it but a signature on an old paper and whatever embarrassment attaches to being the trustee who let the thing fail.

Modern finance meets this asymmetry constantly and calls it something smaller. A sovereign wealth fund with a withdrawal rule; a university endowment that spends a smoothed percentage of a trailing multi-year average, precisely so that one bad December cannot force a sale at the bottom; a pension whose assumed return is set by the same board that would have to raise contributions if the assumption came down. Norway publishes its oil fund's withdrawal rule for exactly this reason: a promise made visible is a little harder for the people bound by it to quietly amend. In each case the mathematics is sound and the mathematics is not the exposure. The exposure is the governance, which is to say the exposure is whether a committee not yet appointed will keep a promise made to people not yet born by people already dead. No instrument exists for pricing that, and the honest reason is that it cannot be hedged: there is no counterparty willing to sell protection against the future virtue of strangers.

So the funds did what institutions given two centuries and only intermittent supervision generally do: they drifted, forgave a little more than the document strictly allowed, occasionally lent past the point good judgment would have stopped them, and still arrived at the finish line with real money, just a smaller pile of it than the curve had promised.

Whether he believed his own confidence is a fair question, given that the shrewdest observer of human conduct America produced in that century is the one who wrote this codicil. He assumed two hundred years of administrative restraint from institutions he knew perfectly well were run by ordinary men, and it is hard to believe he did not notice the size of that assumption. He may simply have trusted the arithmetic. He may also have set the terms exactly because he would not live to see how they were kept, which is a kind of immunity no other sort of investor ever

gets to claim. The codicil does not say which, and he was not a man who left out a joke when he had one available.

The money was real in the end, in both cities, and considerably more than he had given. Boston put much of its share into a technical institute that bears his name until today. Philadelphia argued about its share and then spent it. Somewhere in the minutes of a hundred and some meetings, across seven generations of men who never met the donor and knew him as a face from the currency, sits the difference between what the mathematics promised and what the people delivered, and that difference is the only part of the experiment that was ever in doubt.

THE BASIN BY THE WINDOW

The Cost of Being Early



A basin of chlorinated lime solution stood on a windowsill of the Vienna General Hospital's doctors' ward in 1847, the one piece of equipment in the building that would eventually matter more than any - thing else in it. The hospital's maternity care had long been split into two wards, run on different principles and, it turned out, with wildly different outcomes. One was staffed by physicians and medical students, who

moved freely between the dissecting room and the delivery room; the other was staffed entirely by midwives, who did not. Mothers in the doctors' ward died of childbed fever at several times the rate of those in the midwives' ward, a gap large enough that pregnant women in Vienna were said to beg not to be admitted to the first. Ignaz Semmelweis, a junior assistant on the doctors' ward, noticed the gap, and ordered every doctor and student to dip their hands in that basin on the windowsill before examining a patient. The mortality rate on his own ward fell from 18.3 per cent in April 1847 to 2.2 per cent by June and lower still after that, a reduction of roughly ninety per cent within three months.

He had, at that point, a correlation and a result, and very little else. Louis Pasteur's germ theory was still roughly two decades away, so Semmelweis had no accepted mechanism to explain why washing worked, only the stubborn fact that it did. Several of his senior colleagues also heard, correctly, an accusation buried inside the hypothesis: that a gentleman physician's own hands, fresh from an autopsy, could be carrying death into a delivery room. Being right and being tactful turned out to be two entirely separate achievements, and Semmelweis had only managed the first of them.

His own career paid for the discovery almost immediately. By 1849 the hospital had quietly declined to renew his contract, and Pest became the next stop in a career that would never again hold an appointment of comparable standing. Fourteen years passed before he finally set the complete argument down in a book, published in 1861, and by the time readers got hold of it, he was already accusing his critics of murder in open letters of his own.

Committed to an asylum in 1865 after a sharp decline in his own health, he was injured during the admission itself and died a fortnight later, at forty-seven, of the same family of infection his life's work had been devoted to preventing, two years before Joseph Lister published the paper on antiseptic surgery that finally gave the profession the mechanism Semmelweis had never been able to supply. However the final diagnosis is read, the outcome does not flatter the profession that failed to listen to him while he could still explain himself clearly.

Recognition, when it came, came generously and far too late to matter to him. A university in Budapest carries his name now, as do hospitals and streets across Central Europe, and every medical student meets his story early, the way every discipline keeps one martyr on hand to frighten its own gatekeepers with. None of that reached the man who actually paid for the fourteen years between his first result and the world's eventual agreement.

The financial version of this story has a name: timing risk, the possibility that a position is correct and still destroys whoever is holding it, because markets settle disputes by consensus, and consensus runs on its own clock, indifferent to how the facts happen to stand on any particular Tuesday. A correct thesis can burn through years of capital, patience and reputation before the catalyst that proves it finally arrives, if it arrives inside the holder's own lifetime at all. Value investors have their own private name for the wait: being early and simply being wrong look identical for as long as the position stays open, and only the eventual outcome, whenever it finally shows up, tells anyone which of the two it actually was.

Pure timing risk, though, was not the whole story. He waited fourteen years to publish his full argument, which gave the gap between result and recognition far longer to do its damage than it strictly needed to. When he did finally speak at length, he spent much of it calling his critics murderers in print, which hardened exactly the resistance he most needed to dissolve. Evidence without a mechanism is a hard sell under the best conditions. Evidence without a mechanism, delivered by a man who has just called his entire audience complicit in killing mothers, sells itself to nobody at all.

Florence Nightingale worked the same general problem from a different corner only a few years later, and managed the persuasion half of it considerably better. She returned from the Crimean War with mortality statistics nobody in government wanted to hear, and turned them into a rose-shaped diagram whose proportions made the scale of preventable death almost impossible to misread or set aside. She was already a national figure by the time the report landed, and she spent that standing with evident care, never once burning through it in an open letter calling a minister a murderer. The reforms that followed arrived inside her own lifetime, a comfort Semmelweis's own case was never granted.

Being early, in other words, is not one cost but at least two, charged separately and not always in proportion. There is the cost of the capital or the career spent waiting for consensus to arrive, which nobody can avoid simply by being correct. There is a second, optional cost, charged only to those who make the wait harder than it already is, through impatience, contempt for the people who still need persuading, or simply bad timing in how the case gets made.

Michael Burry's wager against the American subprime mortgage market ran both costs at once, in a little under two years. Burry began buying credit default swaps against subprime mortgage bonds in May 2005, well over a year before the market he was betting against began to crack. By the third quarter of 2006 his own fund was down more than seventeen per cent for the year, and his own investors, who had hired him for an entirely different strategy, demanded their money back and threatened legal action. He was forced to cut his position by roughly two thirds to meet the redemptions, before a single one of his trades had been proven right.

That position, even after the cut, still paid off. Early in 2008 the subprime market finally collapsed in the way Burry had spent three years insisting it eventually would, returning seven hundred and twenty five million dollars to his investors and about a hundred million dollars to Burry personally. He shut the fund down anyway, not long afterward, worn out by two years of lawsuits and investor anger that no amount of being eventually correct ever quite repaired.

Both men were simply right, years ahead of the people paid to doubt them, and comparably sharp in their analysis of why. Whatever separated their outcomes sat in the armour each had standing between himself and the world's impatience while the interval ran its course. Burry had a fund structure that could be redeemed from, painfully, but not instantly, and just enough of a lock-up to survive to the one quarter when the market finally agreed with him. Semmelweis had a hospital appointment that could be, and was, simply not renewed, with nothing contractual standing between his result and his removal.

Patience, in this light, is not only a virtue of temperament. It is also, quite literally, a structural feature of whatever capital or position a person holds while waiting to be proven right, and some structures are built to

survive an argument far longer than others. A fourteen-year academic grievance and a two-year hedge fund drawdown are, underneath the different units of time, the same wait, dressed in different amounts of armour, and that armour is usually what decides who is still standing when the wait finally ends.

Every contrarian eventually meets a version of this interval, the stretch between being correct and being believed, and the data available during it will not tell anyone how long it lasts. Almost everything about that stretch can still be managed except the data itself: how much capital is exposed to redemption, how the case gets argued, and how much patience is left for the people who still need convincing.

Someone young and junior, in an office with considerably less at stake than a maternity ward, has today noticed something true that nobody senior wants to hear yet. The data behind it will not change by waiting. How patiently and persuasively the case gets made, however, remains entirely that person's own choice, and it is usually the only part of the whole interval anybody still has any real control over. The calendar moves at its own pace, unmoved by who turns out to be right. Whether anyone is still listening by the time it finally agrees depends on how the case was made along the way.

A THOUSAND DOLLARS FOR 1923

Inflation and the Memory of Money



In the years after 2008 a second-hand copy of a history of the German hyperinflation was said to fetch as much as a thousand dollars. The book was When Money Dies, by the British writer Adam Fergusson, pub - lished in 1975 as prices in Britain climbed through the 1970s. For years it sat largely unread.

Then central banks started buying bonds on a scale never seen, and financiers made a cult of the book, as the International Monetary Fund's Finance and Development magazine noted in 2011, in a review by the Berlin economist Jürgen Kromphardt. A rumour went round that Warren Buffett had recommended it to a Dutch financier. The magazine leaves open whether the rumour is true, which did the price no harm.

The buyers wanted the room where it ended. On 12 November 1923 Chancellor Gustav Stresemann made Hjalmar Schacht currency commissioner of the German Reich, and the new man installed himself in a small, dim office in Berlin that smelled of old floor cloths. His secretary gave the detail to Fergusson: Schacht read no letters and wrote none. He sat, he smoked, he telephoned. It is a thin inventory for the room from which a

famous rescue was directed, and the rescue had been prepared elsewhere, by other people, in the weeks before he arrived.

Outside, employers had moved from weekly wages to daily ones, and then to paying in the lunch break, so that workers could reach the shops before the afternoon, and the pay went home in sacks and on handcarts. A man named Erich Austilat traded his Iron Cross for eighty grams of liverwurst, a birthday present for a woman called Frida, who worked at the Reichsdruckerei, where the banknotes were printed. In the household of the writer Sebastian Haffner the father, a senior civil servant, was paid once a month. On the first he settled the rent and the transport pass, went to the wholesale market at dawn, bought a month of food and carried it home by taxi, because nothing he earned later in the month would buy as much.

Cafés fared no better. A student at Freiburg ordered a cup of coffee that the menu put at 5,000 marks, drank it, and was handed a bill for 14,000, whereupon the waiter advised him that anyone who wanted two cups should order them at the same time. The purse had given way to the suitcase, and not even the beggars would take cash. Visitors with foreign money lived like kings on the Spree, and had no need of the advice.

Frida's employer, the Reichsdruckerei, had by the autumn farmed its work out to as many as 133 outside firms, whose presses ran by day and by night, and still they could not keep up. Some of the notes went out printed on one side only.

A loaf of bread cost about 160 marks at the end of 1922 and about 200 billion in November 1923. An egg for breakfast went from 800 marks in June to 320 billion by the end of the year.

Savers watched a lifetime of thrift fall away, and the small pensioners and the disabled veterans stood among the worst hit. The father of Walter Levy, later an oil consultant in New York, was a lawyer who had paid faithfully every month, from 1903, into a twenty-year insurance policy; when it fell due he cashed it in and bought a single loaf of bread. Borrowers, meanwhile, repaid their loans in money that bought nothing.

Afterwards came the new money, and the egg cost 32 pfennigs.

Stresemann had ended the resistance in the Ruhr in September, the Rentenbank had been founded by decree in October, and 400,000 public employees, a quarter of the payroll, had lost their posts, so the ground was clear. On 15 November the Rentenmark appeared, exchangeable for one trillion paper marks and pegged to the old gold parity, backed in fact by mortgaged land, a plan to measure it in rye having been rejected on the ground that rye was itself priced in collapsing paper. The same day the Reichsbank stopped discounting government debt, which shut the channel through which the state had been paying its bills with freshly printed money. Five days later Reichsbank president Rudolf Havenstein, who had presided over the printing, died suddenly of heart failure, and on that day Schacht fixed the rate at 4.20 Rentenmark to the dollar, the rate of the years before the war. The new money was kept scarce, and the scarcity did much of the persuading: the farmers, who had refused to sell for marks, regained their confidence, and the food shops began to restock in December.

Frau Barten, of East Prussia, remembered the feeling of having a single Rentenmark to spend, and she spent it on a small tin bread bin; to buy something with a price tag of one mark, she said, was thrilling. The old paper took longer to leave. By the end the earliest inflation notes were worth more as paper than at their face

value, people overprinted them as admission tickets, membership cards and receipts, and some stayed in circulation until the middle of 1924.

Somebody paid for the miracle.

Unemployment rose from 6.3 per cent in August to 28.2 per cent in December, anyone who still held financial assets in marks lost them in the reform, and the state's wartime debt of 154 billion marks shrank to about fifteen pfennigs. Schacht became president of the Reichsbank that month, later served Hitler as economics minister, and was acquitted at Nuremberg.

Stabilisation took weeks. The memory of the episode has taken the better part of a century, and it is still running. By 2010 an American publisher had issued a paperback of Fergusson's book at $14.95, and the thousand dollars and the $14.95 bought the same pages, and anxiety made up the difference.

Kromphardt himself was cooler than his book's buyers. He praised the first-hand testimony, among it the account of a couple who lost their savings and took their own lives, and called the book a striking chronicle of little use for drawing conclusions about the present, since it offers no theory of when printing money becomes hyperinflation. A reprint ended the scarcity. Whether it ended the anxiety the review does not say.

Economists have found the same anxiety in ordinary households. Ulrike Malmendier and Stefan Nagel studied 57 years of survey data from the University of Michigan and found that people weight the inflation they have personally lived through more heavily than the inflation they have only read about. A saver who learned from a grandparent that cash can vanish may prefer real assets for decades after the reason has gone. The authors call it learning from experience.

Germans have a word for it, Inflationstrauma, and the Bundesbank, founded in 1957 after two currency collapses, inherited the mood along with a mandate that later served as the model for the European Central Bank.

Three researchers at the Hertie School in Berlin, Lukas Haffert, Nils Redeker and Tobias Rommel, asked what Germans remember of the years that followed, and published their answer in Economics and Politics in 2021. Many Germans fold the hyperinflation of 1923 and the Depression of the early 1930s into a single crisis in which prices rose and factories closed together. The record has prices falling from 1930 to 1932 while unemployment climbed. In the survey, about one German in twenty-five knew that the Depression had been a time of deflation. The mistake was commoner among the better educated, an awkward result for anyone who expects schooling to cure it.

Brüning, the Chancellor of those years, governed by decree and met the slump with austerity. Baskets of banknotes make a picture, whereas a sound currency beside a closed factory makes a poorer one, and memory seems to keep the pictures.

Photographs of the period are easy to find: children play with bundles of notes, and one shows boys flying a kite made of them.

Many learned the lesson thoroughly and filed it under the wrong decade.

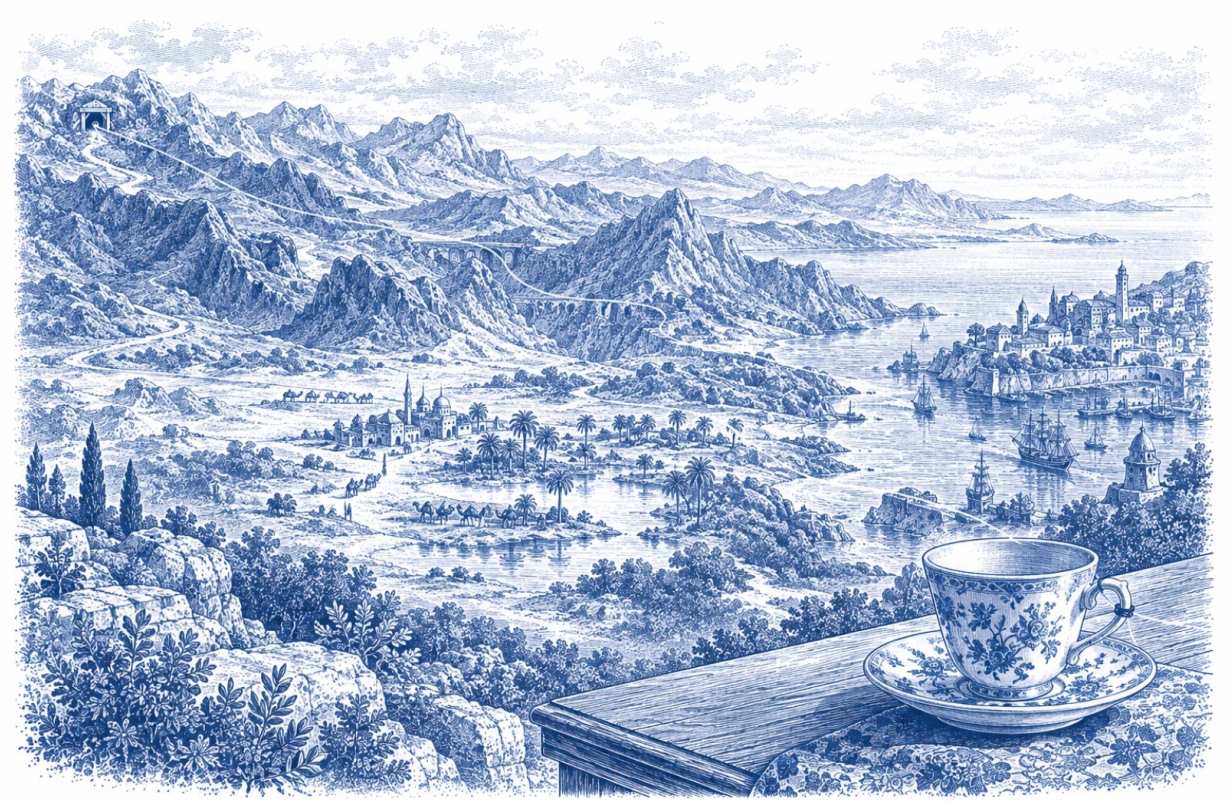
PART IV

RISK

Risk begins with measurable probability and ends with the older problem of how intelligent people behave once the future becomes frightening.

THE ROAD THAT NOBODY TRAVELLED

The Supply Chain as a Line of Faith



The envelope said Samarkand. It was a coarse cloth wrapper with the instructions for delivery written on it, and inside lay the letter itself, folded in a second wrapper of brown silk, as carefully protected as any - thing a merchant could send. In 1907 Aurel Stein picked it out of a ruined Chinese watch-tower west of the Jade Gate, beyond Dunhuang, in a bundle that looks like the contents of a mailbag lost or confiscated on its way. The letter had been written in about the year 313. It seems never to have left China.

Its author was Nanai-vandak, a Sogdian, one of the people of Samarkand who handled so much of the trade between China and the west that their language became the common tongue of the road, and who held that trade, on one reckoning, from the second century before Christ to the tenth after it. He wrote probably from Jincheng, which is Lanzhou today, to two partners at home, and the news he had to give was that the world they traded in had come apart. The emperor had fled Luoyang in a famine, and the palace and the city had been burned. Luoyang was no more, and Ye was no more. The Huns, who only yesterday had been the

emperor's subjects, were said to hold the country as far as Ye, and the Sogdians who had stayed in Luoyang had all died of starvation. He could not say how the rest had fared, since it was three years since a Sogdian had come out from inside China, and three years since he had had a reply from there.

Then he turned to business.

There was money on deposit with a man named Pesakk, which was not to be transferred, and which his partners were to count, keep sealed, and either add to the capital with interest or pass to someone else; for ready cash they might draw one thousand staters or two. There was an orphan boy, Takhsich-vandak, who lived on the income, and who was to be given a wife when he was grown and never sent away from the house. Thirty-two vesicles of musk had gone to Dunhuang to be divided into five shares. Linen was moving from Dunhuang to Jincheng, and was selling well, the translator adds, with a question mark. A man writes that the capital of an empire has burned, and a paragraph later he is anxious that somebody should count the money with care.

Other letters lay in the same bag, and they show what the relay cost the people strung along it. A woman named Miwnay wrote from Dunhuang to her mother that she was living wretchedly, without clothing and without money, that the officials would not help her home, and that a priest was keeping her alive. She wrote again, to her husband, that she had been in Dunhuang three years and had become without hope towards him. A trader at Guzang wrote to his chief merchant about four bundles of a white substance, probably white lead, a great many measures of pepper and a dispute over twenty staters of silver, of which four and a half had been delivered.

Hardly anyone travelled the route from end to end. A caravan took a cargo for one stretch between oasis towns and handed it to another man for the next, and the silk that left a Chinese loom passed through dozens of hands and several languages before it reached a buyer, none of the hands holding the whole journey. The name for the thing arrived late. In 1877 a German geographer, Ferdinand von Richthofen, put the word Seidenstrasse into his book on China for the route described in the account of Marinus of Tyre, and later writers stretched it over everything. The merchants would not have recognised a road. They knew the next man.

Reputation held the relay together, and the Chinese, who saw a good deal of Sogdians, recorded it in a Tang history: they were good at trading and loved profit, and when a boy was born his mouth was given honey and his palms glue, so that he would speak sweet words and grasp gems. I should like to think that families really did it. The saying is accurate about the trade in any case, in which a merchant's whole capital was what the men on either side of him thought of him, and a deposit of staters sat safe in Pesakk's keeping because Pesakk had to go on living among the same people. Trust moved down the line as the silk did, one pair of hands at a time, and nobody was ever asked to trust the whole route. Their colonies ran from Samarkand into Gansu, Turfan, Luoyang and Chang'an, and the headmen of the settlements, called sabao, were taken into the Chinese official ranks. A tax record from Turfan under the Tang shows how closely the network was woven, with twenty-nine of its thirty-five recorded transactions involving Sogdian merchants and thirteen of them with Sogdians on both sides.

A reputation of that kind could also be taken away. In the middle of the eighth century many Sogdians in China backed a rebellion against the Tang, and afterwards many were killed and many more changed their names. One of them, An Chongzhang, petitioned to be known as Li Baoyu, which put a few strokes of the brush between himself and the rebel who shared his surname.

Rome saw only the far end of it. Pliny the Elder put the drain on the empire's purse at some hundred million sesterces a year for the trade with the east, a figure often thought an exaggeration, though it becomes believable if it measures the whole value of the trade and not only the coin. Either way the grievance was about money leaving, and not one of the Romans who bought the goods could have named a single man on the road.

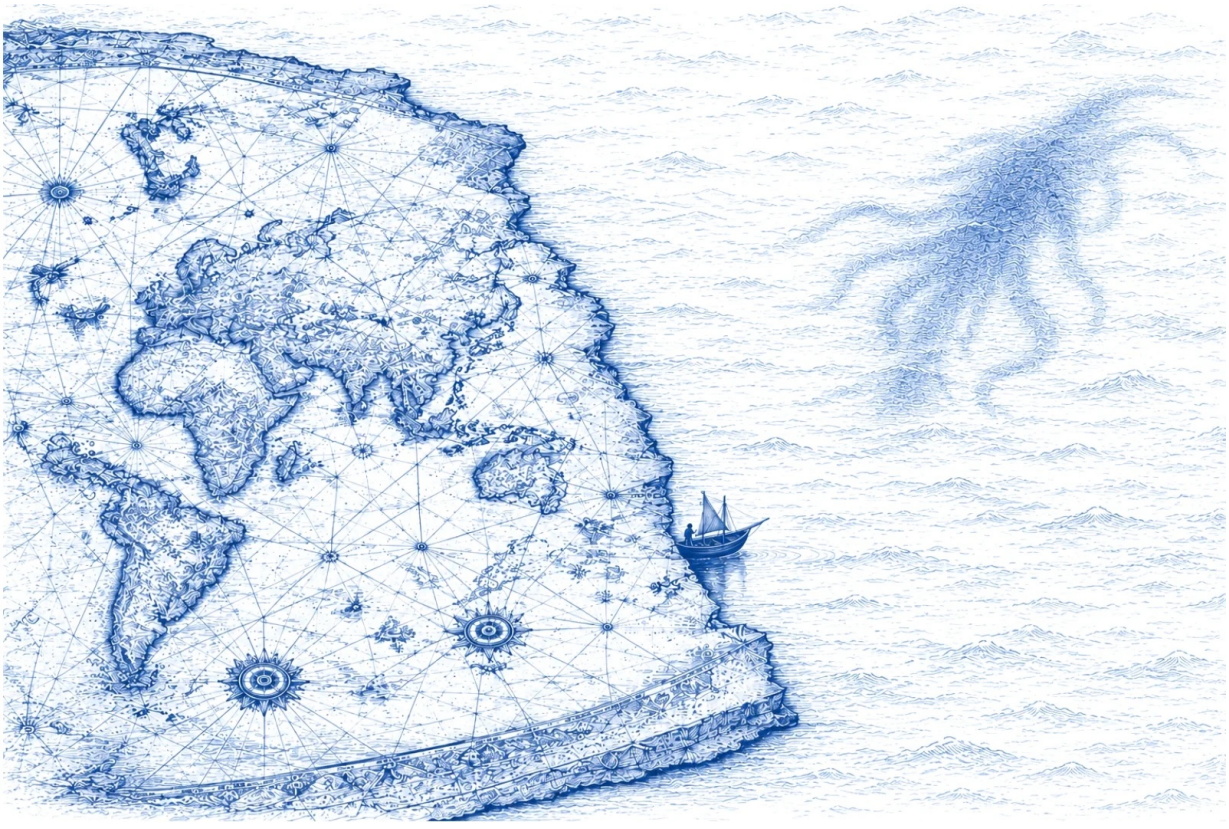
Two thousand years of improvement have lengthened the relay and put the cargo in a steel box. In March 2021 a container ship named Ever Given ran aground in the Suez Canal on the twenty-third and lay there until the twenty-ninth. More than four hundred vessels queued at either end, trade worth nearly ten billion dollars a day was held up, in a canal that carries about an eighth of what the world ships, and a flotilla of tugs and dredgers was needed to move her. On being refloated she was found to have raised a very old question. Her owner declared general average. The rule comes from the sea law of Rhodes, which is lost and survives in quotation, one of them by the Roman jurist Julius Paulus in the third century. The loss, he says, is made good by the assessment of all, which is made for the benefit of all. If a captain throws part of his cargo overboard to save the ship in a storm, everyone with a stake in the voyage pays a share of what went into the sea.

Owners of the cargo aboard had done nothing to run her aground. Before their containers could be released they were asked to post a bond, and the shipowner could hold their goods under lien until the deposit was paid; the insured among them had their insurers give the guarantee. A stranger's accident had made partners of people who had never heard of one another or of the ship, and the sum was reckoned on all of them by a principle that a Roman jurist was already quoting eighteen centuries earlier.

Nanai-vandak's partners in Samarkand never read his letter. They would have learned from it that Luoyang was no more and that Pesakk's money was to stay sealed. It lay in the watch-tower for sixteen centuries in its wrapper of silk, correctly addressed, and the road was the one thing it lacked.

THE MAP WITH NO MONSTERS

Risk Is What Remains After the Model



Hic sunt dracones. Here be dragons. The phrase every schoolchild knows to be written across the blank parts of old maps appears, so far as anyone has established, on exactly one surviving artefact: a small engraved copper globe of about 1508, the Hunt-Lenox Globe, held in the Rare Book Division of the New York Public Library. For most of the last decade it had rather less exclusive company. A globe engraved on two conjoined halves of an ostrich egg surfaced at a London map fair in 2012, dated by its owner to 1504, carrying the identical inscription in the identical place, and for some years the literature treated it as the copper globe's older twin, possibly its model. An international research team concluded in 2024 that the egg was, in fact, a modern cast taken from the Lenox globe itself, most likely during a facsimile campaign in the 1980s, and not the original anyone had hoped for. One authentic object, then. Its own would-be sibling had made exactly the kind of confident claim this article is about, and it took twelve years to catch. The legend appears exactly once, on the coast of Asia, nowhere near any void, and generations of cartographers who supposedly reached for that

same convention whenever the unknown needed marking would search their own margins in vain for a second example.

What mapmakers actually wrote in the empty spaces was more interesting and considerably more disciplined. Mercator, on his world map of 1538, inscribed across the southern continent a line to the effect that it is certain that there are lands here, but how many and within what limits remains uncertain. He was asserting existence while explicitly declining to assert extent, a statement with its own confidence interval attached to it in the same breath. The cartographer was distinguishing, in a single sentence on a printed plate, between what his evidence supported and what it did not, and he did it in public, on the face of the document, where a buyer could not read the claim without reading the caveat.

Consider what that placement accomplishes, since it is the whole of the matter. A caveat inside the measurement travels with the measurement. A caveat beside it does not. The reader of the 1538 plate had no way to extract the coastline from the admission that its limits were unknown, because the admission was printed in the same ink at the same scale in the same visual field. He could ignore it, as readers ignore anything, but he could not receive the one without receiving the other.

The instrument trade learned the same lesson a century and a half later and rather more precisely. Edmond Halley, commissioned into the Royal Navy for the purpose and not by training, sailed the pink Paramore into the Atlantic at the turn of the eighteenth century to measure magnetic variation, and what he produced was a chart on which curved lines joined every point where the compass erred by the same amount, translating the size of an error into a shape a navigator could read at a glance. A navigator knew his compass lied; the chart told him by how much, at his position, in that year, and Halley marked on the plate that the values would shift over time. He was right about the shift. The isogonic lines have moved a great deal since.

Getting there nearly ended the whole project on the first crossing. Halley's own lieutenant challenged his fitness to command a naval vessel at all, an unusual objection to raise against a man Trinity House and the Royal Society had both vouched for, and Halley sailed home to see the matter settled by court martial; when the court let his officers off with a mild rebuke, he thought the sentence far too lenient and said so. A civilian directing a naval ship on a scientific errand was itself the novelty the officers seem to have objected to, and the Admiralty's fix, giving Halley his own captain's commission before the second voyage, says something about which kind of man the establishment actually trusted with the survey, once it came to it. He published the finished chart in 1701, the first of its kind ever printed, and the lines it introduced eventually gave Alexander von Humboldt the model for the temperature-contour lines still drawn on every modern weather map.

Honesty, in both documents, lay in what they refused to claim, and the refusal was structural rather than moral. Neither man was more scrupulous than his colleagues. Both were working in a medium, one plate, one visual field, no appendix, that made it physically awkward to publish a number without publishing what was wrong with it.

Then the notation improved, and the medium changed with it.

A modern risk report cannot do what the 1538 plate did, and the reason lives entirely in how the document is built. The number sits in a cell. The caveat sits in a footnote, or in a methodology appendix, or in a

conversation that the person reading the cell did not attend. Institutions ignore their model risk disclosures for a purely structural reason: the disclosure and the decision live in different documents, and only one of the two is circulated to the committee that decides. Precision has become separable from its own qualification, and anything separable will eventually be separated by someone working under time pressure who needs the figure and not the discussion.

Embarrassingly, the pattern that follows repeats with a consistency that ought to trouble more people than it does. A class of exposure accumulates a record. The record is clean, because the event that would dirty it has not occurred within the window. Capital flows toward the clean record, since capital is priced against measured variance and this one measures low. The exposure grows until the sum at risk is large, and then the unrecorded event occurs, and the subsequent analysis observes that the model contained no term for it. This last observation is always correct and almost always useless, because the model could not have contained a term for it: a term requires a parameter, a parameter requires an estimate, and an estimate requires observations that by definition do not exist. The failure sits one step upstream of the arithmetic itself, in the moment an absence of observations gets converted into a small number when it should have stayed no number at all. That conversion is a presentational act, performed by someone who needed a figure for a committee that would not accept a blank.

Mercator had the option of the blank and used it. He also drew a southern continent of a size and shape that no evidence supported, which is worth saying plainly, because the temptation here is to conclude that the old cartographers were wiser than we are, and they were not. They admitted ignorance where admitting it was cheap and filled space confidently where a buyer expected a full plate. Ignorance is not evenly admitted even by the people who admit it best.

Of everything recruited to make this point, the dragons turn out to be the cleanest illustration. A profession that wrote careful, hedged, evidence-bounded statements into the margins of its unknown territory has been remembered instead for a decorative monster it essentially never drew. The honest notation did not survive as legend. The picturesque one did, on one globe, in one language, and it now stands in for a discipline it misdescribes entirely, which is roughly what happens to a model risk disclosure between the appendix where it is written and the boardroom where the number is read aloud.

SHIPOWNERS PAINTED THEIR OWN SAFETY LINE

The Limit That Became a Target



The Prime Minister had just told the House of Commons, on 22 July 1875, that the Merchant Shipping Bill could not be carried that session. Benjamin Disraeli spoke of his unfeigned and unaffected regret and promised to try again next year, if the government were still in office.

Samuel Plimsoll, who sat for Derby, rose in great excitement and begged him not to send thousands of living men to sudden death. Hansard records the sentence that followed: “I am determined to unmask the villains who send to death and destruction”. The Speaker, Sir Henry Brand, presumed that the honourable member did not apply the word to any member of the House.

Plimsoll answered, “I did, Sir, and I do not mean to withdraw it.”

Disraeli, rising under a sense of deep pain, moved that he be reprimanded. A friend told the House that Plimsoll was at that moment extremely ill, and the matter was

put off for a week. As he went out he turned and called back, “Do you know that thousands are dying for this?”

He was born in Bristol and had once failed as a coal merchant in London, where by his own later account he lodged in a common house at seven shillings and two pence a week. His fellow lodgers were seamen ashore between voyages, and by one account they told him shocking tales of the vessels that sailors called coffin ships. In Parliament he spent years campaigning against the overloaded and unseaworthy ships they described. A Royal Commission was appointed in 1873 on his motion, and his book Our Seamen carried the case to the public. The ships left port so low in the water that the first gale could take crew and cargo together, and critics of the trade added a darker point: with a ship heavily insured, a vessel lost at sea could return more to its owner than one delivered to port.

Seamen who signed on, looked the ship over at the quay and declined to sail were guilty of desertion. Years before Plimsoll rose in the House, a group of sailors wrote to Queen Victoria to complain that they had been convicted of exactly that for objecting to dangerous vessels, and an inspector of prisons reported that nine out of twelve prisoners in the jails of south-west England were sailors, there for refusing to go to sea in ships they thought unseaworthy. Some of the owners sat in the Commons. Edward Bates, a Liverpool shipowner who represented Plymouth, is reported to have lost six ships in a single year, and he was later made a baronet.

Even the Spectator, an admirer of his purpose, wrote on 24 July that in the intensity of his sympathy with the seamen he had “lost his head”, and called the scene an “outburst of morbid excitement”. Few reformers receive so courteous a rebuke from a friendly paper. The public took another view. His written protest, which his wife had waited in the Ladies’ Gallery to hand to reporters, was printed in full, and a meeting in Sheffield is said to have remarked that if he was mad, the sooner he bit a few more members the better. By 28 July the government had a stop-gap bill ready to let surveyors detain ships they believed unseaworthy, and it became law on 10 August.

Lloyd’s Register had published a rule of thumb in 1835: three inches of freeboard, the height of a ship’s side above the water, for every foot of depth in the hold. Many owners ignored the rule, since a hold packed to the last bale earns more and sinks sooner, and in 1874 Lloyd’s required a painted line on the newly built awning-deck steamers it classed, a rule that bound only the ships it inspected.

Under the Act of 1876 a load line became compulsory for British ships. The mark that came to carry Plimsoll’s name was a disc with a horizontal line through its centre. The Act required the line and left the owners to decide where on the hull it went. An owner who painted the mark high satisfied the law with a vessel that could still be loaded to the gunwales. Some, it is said, placed the mark on the funnel. The Lloyd’s Register Foundation passes the story along with an “apparently”, and the other accounts I could find repeat it with the same hedge. I would pay to know which funnel it was. A steamer loaded honestly to a mark on its funnel would have reached the bottom of the sea well before it reached the paint, and the story may be a joke that survived because it was funny. The documented part needs no help: for fourteen years the limit on British shipping was a figure supplied by the people it was meant to limit.

Parliament closed the gap in 1890. A new Act fixed the position of the load line on British ships by law, working from tables the Board of Trade had drawn up, and the owner's opinion of his own vessel ceased to be an input. The first international convention on load lines followed in 1930.

A limit marks the point where danger begins, and a hold loaded exactly to the line is, on paper, a ship within the rules. Every inch of freeboard between cargo and mark looks like money abandoned on the quay, and the rival who loads to the line collects the freight that the cautious owner declined. Charles Goodhart's remark of 1975 about monetary targets is usually paraphrased as saying that a measure stops measuring well once it becomes the target, and the load line is that remark in paint and iron.

Early in 2012 the same temptation reached a London office of JPMorgan Chase. The bank's Chief Investment Office, a unit known for investing surplus deposits prudently, had built a book of credit derivatives that ran past its limit on value at risk, the standard estimate of how much a portfolio could lose over a short period. A request went up to the chief executive, headed "APPROVAL NEEDED: JPMC 95% 10Q VaR One-Off Limit Approval". The reply, attributed to Jamie Dimon by a Senate subcommittee's exhibit list, ran to two words: "I approve." The limit was raised for the time being, and the breach was over.

Near the end of January the model was changed. The measured risk of the book fell by about half, in the subcommittee's account, and the positions had not changed by a single contract. The original limits stayed in force, untightened for the new model, and the traders used the headroom to add positions.

Any portfolio that outgrows its limit offers a risk officer two ways to restore order: shrink the portfolio, or shrink the number. The first costs positions, fees and the goodwill of the desk. The second costs an afternoon with a spreadsheet, and this spreadsheet was fed by hand. The bank's own task force later found that one formula had divided by a sum where its builder had intended an average, likely muting the measured volatility by a factor of two.

Two numbers came out of that quarter for a single book. The bank first reported a value at risk of 67 million dollars for the CIO, without mentioning the new model. After the trades became public the bank revoked the model on 10 May and restated the figure at 129 million. Losses by the end of 2012 stood at some 6.2 billion dollars. The owners placed the line and left the ship alone. The bank moved the ruler and left the limit alone.

Modern load lines carry several marks, for tropical water, summer, winter and the winter North Atlantic, because the sea differs by place and season, and the master of a ship cannot invent a fifth when the cargo is tempting.

Freeboard is the only part of a ship that earns nothing until the gale. Then it pays out once, by still being above the water, and no ledger has a column for that day.

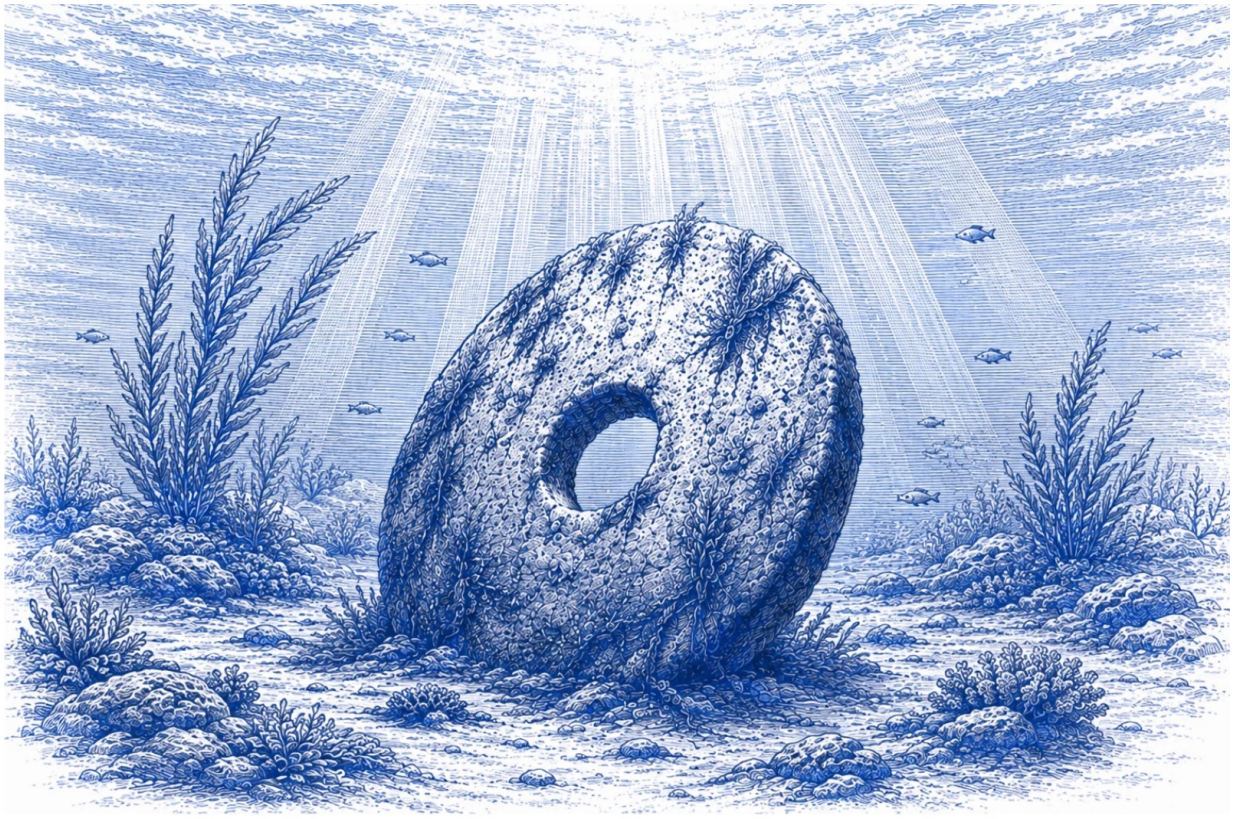
PART V

POWER

Power concerns the quiet authority to define the units, borders and hierarchies within which everybody else must decide.

THE COINS THAT NEVER MOVED

Who Gets to Define Money?



Yap has no limestone. That single geological fact is the beginning of the whole arrangement, and it is the detail most retellings drop first. The stone from which the discs were cut lies on Palau, some two hundred and fifty miles of open Pacific away, and every disc on Yap arrived there by canoe and raft after men had quarried it with shell tools on somebody else's island, negotiated for the right to do so, and carried it home across water that regularly killed them. Some of the largest discs, quarried whole from a single block of stone, exceed three metres across and weigh several tons, far too heavy to lift without a crew and rope; that impracticality was itself the design, since a stone nobody could carry off was a stone nobody needed to guard. A chief typically sponsored the voyage and took the largest share of what it brought home, and a single expedition could take months and, on the open crossing alone, cost lives to the weather. Their worth came from the very difficulty of that voyage, and the islanders kept the histories of individual stones the way a European family keeps the provenance of a painting.

One disc, according to tradition, went over the side during a storm on the return. The crew came home without it and with an account of where and how it had gone down, corroborated by everyone aboard. The account held up because everyone with any reason to dispute it had been sitting in the same canoe when the stone went under, and a fact witnessed by your only rivals is a fact that is very hard to contest later.

The village accepted the account. The stone was held to have arrived; its owner traded on it for the rest of his life, and ownership passed down through his family for generations afterwards, transferring hands that never touched it and eyes that never saw it. Nobody dived for it. Nobody proposed that they should. The arrangement had stopped to need the object long before anyone noticed, which is the ordinary career of every monetary instrument that has ever worked.

What makes the case more than an anthropological curiosity is what William Henry Furness recorded when he spent time there around 1903 and published a few years later under the title The Island of Stone Money: the ownership system on Yap functioned as a public ledger held in memory. There was no register and no writing. There was a community small enough that everyone knew which stone belonged to whom and what had been given for it, and that shared knowledge alone settled every transaction; the stones themselves never needed to move at all. Moving a two-metre disc is, above all, an engineering problem, and the islanders had correctly identified that the engineering itself was optional.

Keynes read Furness not long after the book appeared and thought the Yap arrangement more rational than most European monetary practice of his own day. Milton Friedman read the same material in 1991, and did something sharper with it than admiration.

His parallel was an episode at the Federal Reserve Bank of New York. In the nineteen-thirties the Bank of France, wanting its dollar holdings converted into gold but not wanting the expense and risk of shipping bullion across the Atlantic, asked the Federal Reserve to hold the gold on its behalf. Clerks went down to the vault, moved the appropriate number of bars into a compartment designated as French, and put a label on the drawers. The newspapers reported a loss of gold from the United States. The financial press discussed the outflow and its implications for American reserves. No metal crossed anything at all, and the bars in question may not even have moved shelves; the entire transaction consisted of a change in the description of a compartment and the ledger entry that recorded it.

Friedman gave his essay the same title Furness had used six decades before, and his point was that the bankers and the islanders were performing exactly the same operation, and that only one of the two groups had ever been described as primitive; foolishness had nothing to do with it.

This is what the Yap system proves: an asset requires exactly two things to function, an agreed record of who holds the claim, and a community willing to enforce that record. It does not require the object. It does not require the object to be visible, or accessible, or in the same hemisphere, or, in the case of the sunken disc, extant in any sense a receiver could act upon. The physical item is a device for anchoring the record when the record cannot be trusted on its own, and a community that trusts its own record can dispense with the anchor and lose nothing. Yap could dispense with it because everyone enforcing the record lived within walking distance of everyone else who might contest a claim; the mechanism depends on a population small enough that reputation can

substitute for paperwork, and larger societies have generally found they cannot get away without the paperwork.

Modern settlement is this, at scale, with worse acoustics. The depository itself exists because physical certificates once nearly broke the system built on them: trading volume in the late nineteen-sixties outran the back offices meant to move paper between firms, exchanges shortened their hours so clerks could catch up, and immobilising the certificates in a single vault, with ownership tracked only in ledger entries, was the fix that stuck. Securities are held in a depository, in America a single company called the Depository Trust Company, under a name that is not the beneficial owner's; title passes by book entry between accounts and the certificates, where they exist at all, sit immobilised in a vault nobody visits. The depository's own nominee name, Cede and Company, appears on the face of nearly every certificated American security still in existence, one fictional holder of record standing in for millions of real owners who will never see the paper and would not know what to do with it if they did. Central bank gold has largely been held in custody on someone else's premises since decades now, tracked as a numbered entry on an allocation list. None of this is a scandal and none of it is new. It is the Yap arrangement with a legal department.

Cryptocurrency proposes the opposite arrangement: a ledger nobody owns, verified by anyone who cares to run the software, designed by people who distrusted every small number of institutions history had ever produced and who answered the trust problem by making the ledger too large and too widely copied for any single institution to quietly alter it. Whether a distributed ledger held by strangers who owe each other nothing ends up more trustworthy than a village that knows everyone's face is a question the islanders never had to ask themselves, and the industry built to answer it is, by the standards of Yap, remarkably young.

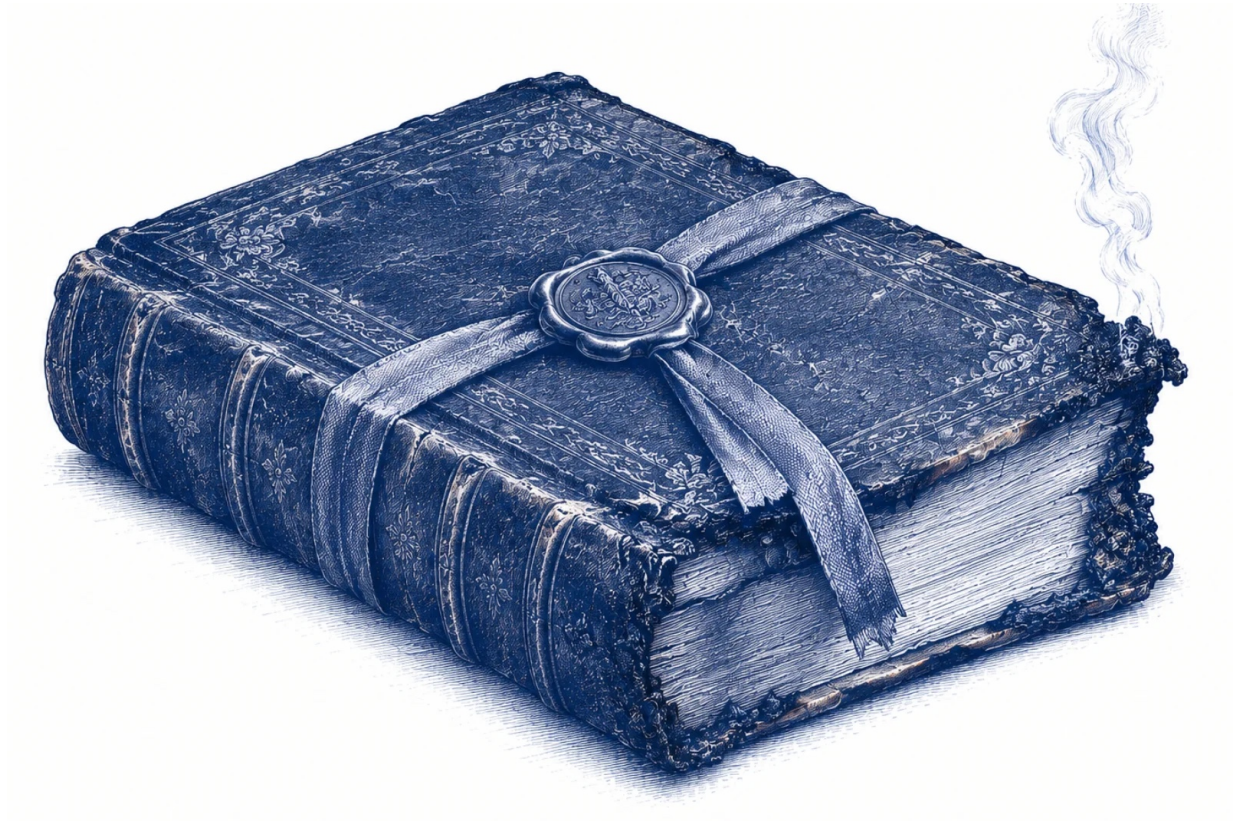
Where it gets uncomfortable is in the one thing the islanders had that the modern version does not. Their ledger was held by everyone. There was no registrar to be captured, no single institution whose failure would leave ownership undeterminable, because the record was distributed across the entire population that had any interest in enforcing it. Modern records are held by a small number of institutions, and the question of who is permitted to write to them is answered by charter and statute, a form of memory considerably more exclusive than a neighbour's recollection ever was. Money is wherever the agreement says it is, but somebody has to be authorised to speak the agreement, and that authority is the actual asset in the whole arrangement. A share register or a central bank's own balance sheet is, in this sense, a village ledger with far fewer villagers and a locked door. The stone was never the point. Neither is the gold, and neither is the compartment label. The point is the pen.

2022 supplied the clearest modern proof of this, when Western governments froze a large share of a foreign central bank's reserves. No bar of gold and no bond certificate moved an inch; what stopped, instead, was the willingness of anyone downstream to honour that central bank's instructions, the Yap mechanism running in reverse. A reserve turns out to be a form of permission, held at someone else's pleasure, wearing the metal only as a historical costume.

That disc at the bottom of the lagoon went on being, as far as anyone on the island was concerned, a family's wealth for generation after generation, without once coming back into view. Several currencies kept in plain sight on dry land, in vaults built specifically to watch over them, cannot make the same boast

PERMANENTLY TEMPORARY SINCE 1842

The Balance Sheet That Became a Constitution



On 18 March 1816 Lord Castlereagh wrote to the Prince Regent with news that no minister enjoys de - livering. The House of Commons had voted against the continuation of the property tax, which was the income tax of the time, by 238 votes to 201. The government had lost by 37, having counted on winning by about 40. Castlereagh gave the Prince Regent his explanation in the words “numbers of the friends of the Government going away and some going against”, which is the one ministers always give. Then he did the sum. The defeat left the government “but 12 millions of clear revenue to meet this year’s expenditure of 30 millions.”

Pitt had imposed the tax in 1799, to fund the war against revolutionary France, at ten per cent on the larger incomes. It was widely abhorred, and it raised less than six million pounds against the ten million the government had hoped for. Everyone understood it to be temporary, and that word was the whole of its political bargain, since a tax that arrives with an end date carries a promise, and promises can be quoted back.

The Peace of Amiens repealed it in 1802. Renewed war brought it back in 1803 at half the rate, collected at source and arranged in schedules, a design far more efficient than the original, and by 1806 the rate stood at ten per cent again. Then Napoleon fell, and Parliament was asked to keep a wartime tax in peacetime.

Britain answered with paper.

Petitions against renewal reached the House by the hundred in the space of six weeks. Farmers in Durham wrote that they had paid the tax through the war with "patience and cheerfulness". The Corporation of the City of London sent its sheriffs, in their official robes, to present its own, a sight that is hard to vote against and harder to forget, and described the assessment process as an "odious, arbitrary, and detestable inquisition into the most private concerns and circumstances of individuals." Henry Brougham, among the most effective speakers on the opposition benches, helped to turn the petitions into a campaign, and the critics reminded the House that the government had promised in 1799 that the tax would end with the war.

Vansittart, the Chancellor of the Exchequer, replied that no promise had been made. He went to the record for it. Pitt's opening speech, he said, had declared that the tax should continue for one year of peace for every year of war, and Lord Henry Petty, who held the office in 1806, had made "no pledge of his own opinion respecting the permanency of the property tax in time of peace." It was a lawyer's answer to a crowd of farmers and aldermen, and the Commons took the petitioners at their word.

George Cruikshank etched the result that year as "The Death of the Property Tax!" Brougham, John Bull and the British Lion attack a hydra, and in the background the Prince Regent and his ministers are running away.

Victory had a price. For the next quarter of a century the Treasury lived on customs and excise, taxes that fell on ordinary consumers at the shop counter, whom an income tax starting at 60 pounds a year had never reached.

Then comes the story that attaches to the repeal. The records of the tax, so the account runs, were ordered burned in Old Palace Yard at Westminster, so that no future minister could be tempted to revive the machinery. One telling has Brougham, the tax's arch-enemy, helping to stoke the fire. Another has the papers cut into pieces and pulped, a tidier end for a tax and a poorer one for a legend.

Hansard offers a date that sits awkwardly with all of it. On 3 May 1816, some six weeks after the vote, a member rose in the Commons to ask what the Treasury meant by a letter of 17 April, calling upon the surveyors of taxes for "full and complete copies of the assessment of every man's income." Those books were "accessible, not merely to the commissioners of taxes, but to every little petty clerk in the office". The Chancellor of the Exchequer replied that no new orders had been issued on the subject, and another member gave notice that he would soon move that directions be given to the board of taxes "in order that they may take steps for the destruction of all such records." A bonfire that had already burned would have spared everyone the motion.

A variant says that duplicate returns had been lodged with the King's Remembrancer, an officer of the Exchequer, and survived in sacks until they turned up at the Public Record Office. Peel, who in 1842 found no old records to hand, suits the

fire and spoils the sacks, since duplicates in a Remembrancer's keeping would have given him something to find.

I would like the bonfire to be true, and I would not bet on it.

Peel needed money because he was cutting tariffs as Britain moved towards free trade, and the cuts reduced the customs revenue on which the Treasury had been living since 1816. In March 1842 he proposed the income tax at seven pence in the pound on incomes above 150 pounds a year, and it was only just, he told the House, "in the first instance, to limit the experiment to a period of three years." A tax that Parliament might not have voted as permanent passed easily as an expedient, and the label carried it a long way.

Gladstone, in his first budget of 1853, spoke for four hours and forty-five minutes, fortified by sherry and beaten egg. He called the income tax "a mighty engine" and lowered the exemption from 150 pounds to 100, believing that a wider circle of taxpayers would build support for repeal. Then he gave the House a date: "Under this proposal, on the 5th April 1860, the income tax will expire." The date was seven years off and comfortably far away. The Crimean War intervened. The date came, the tax stayed, and in 1860 he raised the rate. The tax now supplies roughly a third of government revenue, and in law it remains an annual levy that Parliament must impose afresh each year.

Economists noticed the habit a long time ago. Alan Peacock and Jack Wiseman argued in 1961 that a crisis lifts taxation and spending to a new level and that the totals do not fall back when it passes, and Robert Higgs found the same in the United States in 1987. Payrolls, pension schemes and mortgage affordability tests grow up around the new instrument, and removal costs every adjustment made in the meantime.

Across the Atlantic the Federal Reserve offers a younger specimen. Its balance sheet stood at somewhat under one trillion dollars before 2008, peaked at nearly 9 trillion in the spring of 2022, and when the Fed ended its run-off in December 2025 still stood at about 6.6 trillion, roughly seven times the old size. Since October 2008 the Fed has paid interest on the reserves that banks hold with it, and in January 2019 its Open Market Committee announced that it would go on operating with an ample supply of those reserves. The rescue has been moved into the operating manual, and the operating manual is a place where very few things are ever struck out.

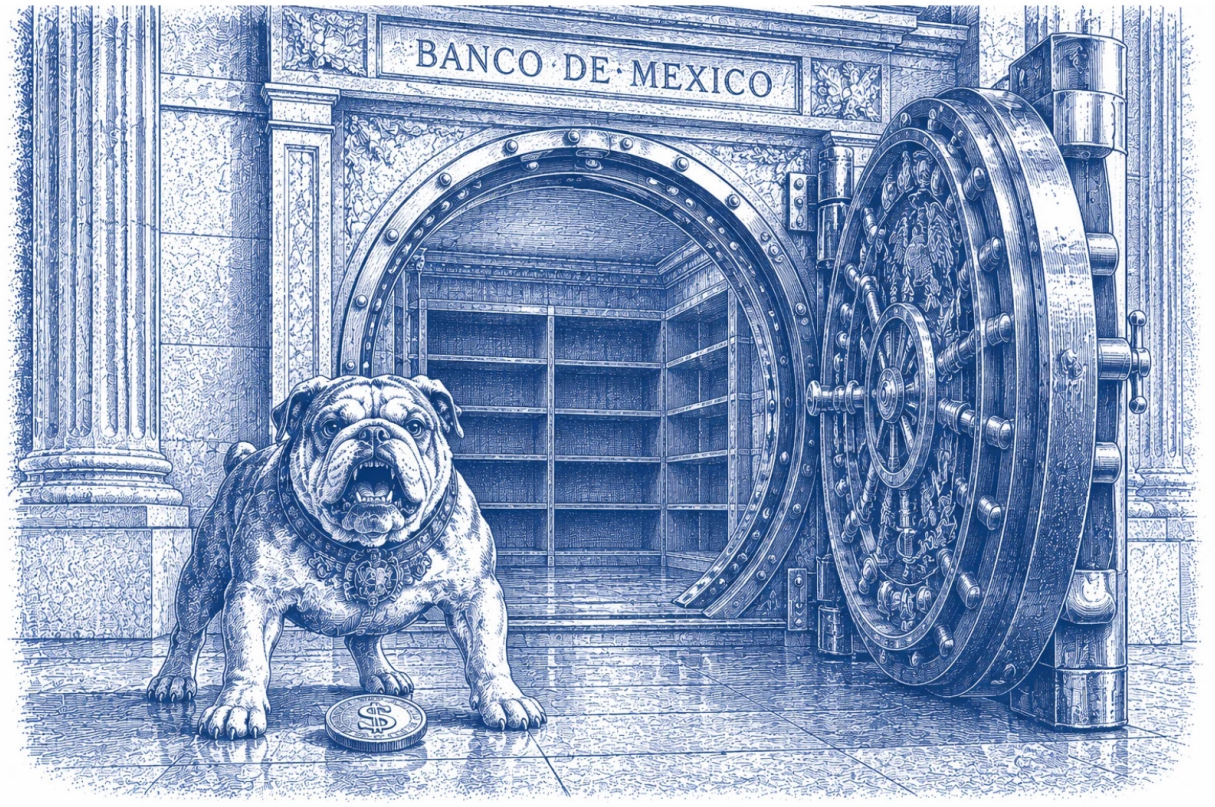
Parliament in 1816 could end the tax, and the Commons used that power against the government's open wish. The power remains, since the tax lapses unless Parliament renews it, and the House has passed it again in each year from 1842 to this one. A central bank balance sheet has no annual vote, and nobody stands in a lobby to be counted against it. The institution that decides when the emergency is over also runs the instrument, and has no vote to lose.

Each arrived as an expedient, and each now holds up too much to move.

In the general election of 1874 both Gladstone and Disraeli promised to abolish the income tax, Gladstone for the second time, having told the House in 1853 that it would expire. Gladstone lost to Disraeli.

LIKE A DOG

The Devaluation and the Politics of Admission



In August 1981, by most accounts, the President of Mexico, José López Portillo, told his countrymen he would defend the peso "como un perro", like a dog. He chose the animal himself. A man who wished only to sound firm had a dozen words available, and he picked the one that does not negotiate, does not read the markets and will go on guarding the door when the house behind it has been emptied.

Mexicans had learned to take the number seriously. For twenty-two years, from 1954 to 1976, the dollar had cost 12.50 pesos and nothing else, so that a Mexican of forty had hardly seen the price move in his working life. Then in 1976 it jumped to 19.40, and the president who took office that December would be judged by what the number did next. The oil came soon after, and the banks of New York and London lent against it as quickly as the paperwork could be drawn, in dollars, on the understanding that a barrel of crude could only grow dearer. Earlier in his term he had promised that Mexicans would learn to administer abundance. Then the price of oil began to fall in the summer of 1981, American interest rates stayed high, and

a debt written in dollars grows heavier, whenever the peso weakens, in precisely the currency the borrower earns.

The dog lasted until February.

That month in 1982 the central bank let the peso float after it had been trading at roughly 25 to the dollar, and anyone who owed dollars woke to find the same debt measured in a larger number of pesos. Mexico had company in its trouble, since half of Latin America had borrowed on the same terms and was waiting to see who would blink first, but the Mexican president had the distinction of having announced his position in advance. A government that lets its currency slide is conducting a piece of arithmetic. A government that has promised to defend it like a dog is, when the slide comes, breaking a word.

Economists, on the whole, regard a devaluation of that kind as housekeeping, overdue and unpleasant. The public keeps another set of books, in which the only entry is whether the man kept his promise, and the answer is written in ink. Both ledgers are honest. Only the second is ever read again.

Kitchens kept the second set. Tortillas, the staple of the Mexican table, doubled in price in the weeks before mid-August 1982, and a longtime foreign observer back from a business trip told a reporter that he had never seen Mexico so economically troubled.

Leaders delay, because an early admission costs the vow at once, whereas a late one costs the reserves, which belong to nobody in particular. By August 1982 the finance minister, Jesús Silva Herzog, was telling creditors that Mexico could no longer service its debt, and he announced a moratorium of ninety days. Most commercial banks drew in their lending to Latin America soon afterwards, and a good many short-term loans fell due at once.

Savers had done their own reading long before the September speech. By one historian's count about ninety per cent of Mexican bank accounts were held in dollars, although peso accounts paid more interest, and by July some fourteen billion dollars had gone into foreign banks, with another twenty-five billion in American real estate. On 12 August the government froze bank accounts and converted them into pesos.

Some of that money had a face, if a faint one. In San Antonio an estate agent, Gail Gilliam, advertised condominiums in Mexican magazines and hired a Spanish-speaking representative. After the August devaluation and the nationalisation of the banks, she told a reporter, the market "just about died", and her trade with Mexico fell by ninety per cent. On South Padre Island, another agent said, Mexicans had bought about two condominiums in five. She sent her letters south in plain white envelopes, because her clients believed their telephones were tapped. Buyers could not get pesos out of Mexico to pay what they owed, and in Park City, Utah, one project stood with plywood floors and some sheetrock.

By the last day of August the president had decided, and he wrote in his memoirs that he would nationalise the banks, impose total exchange control and announce both the next morning.

He did so on 1 September, from the tribune of San Lázaro, at his sixth and final report to Congress. He blamed bankers and the people who carried dollars out of the country, and put the sum that speculators, with the banks' help, had drawn out of the economy at about fifty billion dollars, against a national product of 120 billion. He said that he was responsible for the helm and for none of the storm. He said that Mexico had been

plundered and would not be plundered again, and, according to the accounts, he wept when he asked forgiveness of the poorest. The chamber interrupted him with applause forty times, a record for that occasion, and the applause was for a man who had just announced that his promise had failed.

Outside the chamber the reception was colder. The banks stayed shut until the following Monday, and the head of the central bank resigned. Observers in the United States called the nationalisation a grandstand play that might well backfire, and a top official conceded that if it failed to help, at least they could say they had tried. The government was to assume about ten billion dollars of private foreign debt, on top of a public debt of fifty-seven billion. On the black market, on the day of the speech, a dollar fetched almost two hundred pesos.

Twelve days later the magazine Proceso printed a story about a hill.

It stood in Bosque de las Lomas, on the western edge of Mexico City, and could be seen from the highway to Toluca. The ground ran to some twelve hectares, and on it were going up a cluster of mansions with medieval roofs and colonial windows, a great many chimneys, a lookout, a library-house of three spiralling floors. The president's family was to live there. The neighbours in Cuajimalpa complained, and the magazine reported that the money had come, allegedly, from the public purse. People began to call the place the Colina del Perro, the Dog's Hill, after the remark of August 1981. Who said it first I could not establish, and perhaps nobody could, since a nickname of that quality tends to arrive in many mouths at once.

For a year the president had said that he was defending the peso. Now Mexicans were being shown where the guarding had been done from.

Documentaries later spoke of a library of more than thirty thousand volumes and a dome that served as an observatory, and their experts called the whole affair an act of frivolity and megalomania. The main compound has since vanished, and a residential development stands on the site, with a tower of thirty-four storeys. The last piece of it, the library-house on a lot of 5,200 square metres, was sold in 2013 and had been pulled down by 2018. The remark of 1981 has outlasted every building that the nickname was given to.



Here ends the first issue of EW Journal.

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EW JOURNAL · I

In the spring of 1648 a water board on the Lek
promised a canon of Utrecht fifty guilders a year, for ever.
Its clerks wrote every payment in the margins
until no room was left, and its successor still pays,
at half the rate. That promise leads the first issue
of EW Journal. Fifteen essays follow, from an emerald
found to be glass to a peso that a president
vowed to defend like a dog.

"A promise between two men ends when either dies.
This one was made between a chair and a chair,
and somebody has always been sitting in both."

NEXT ISSUE

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Essays from January to March 2027

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