Money Magic

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From ›obelos‹ to ›e-cash‹

Fresh cash – paper money. What can be more exciting and invigorating than a handful of crisp, new banknotes that have never been folded? Maybe not for some, like Howard Hughes, the mystery-shrouded American oil magnate. He suffered from chrometophobia, the fear of money, a clinically documented disorder. How ironic can destiny be. We run our fingertips with relish over the engraved rills and ridges of a banknote, hear the creaseless bill crackle dryly when pressed between our fingertips, and savor its scent of fresh printer's ink. In the modern world, with its division of labor, life without money is inconceivable. We use money as a measuring unit in pricing a transaction, offer it as a medium of payment in settling a debt, and make it a store of value for our savings. This is the stuff that makes dreams come true. Yet when and how exactly did it come to pass that we began to prefer this abstract »money« – the »third good« – to the concrete value of a real good in a trade? The answer is hidden in the dawn of civilization. The most exotic of media were employed during the slow transition from simple barter to free trade: bricks of pressed tea leaves in Tibet and southern Siberia, stone slabs with drilled holes on the island of Yap, cakes of salt, axes, cooper rings, glass beads, cowry shells in Africa, and many, many more. Rarity, stability of material value, and sometimes also the simple matter of durability determined the selection.

The priests of antiquity probably were the first to ponder the invention of the abstract good »money.« They wanted tribute of lasting value, payments that could be compared with one another, for their sacral services, such as fertility rites and oracles. The idea of money germinated comparatively early, in Mesopotamia in the fourth millennium before our modern time measurement. The Sumerians set fixed quantities of metal – gold, silver, also copper at times – because they grew tired of measuring,

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ISBN: 3-527-50236-X

weighing, and examining every item separately, again and again. That was the first near-money. But Pheidon, the tyrant of Argos according to Greek chronicles, first took the step to the minting of coins in northern Peloponnesus at the transition between the eighth and seventh centuries before the Christian era. He had two aims in mind: fostering trade and strengthening his own authority. This was the dawning of the right to strike coinage. Judges of that time received for their verdicts a wage of roasting skewers, *obelos*[1], from which derived their claim to a certain number of cuts of meat from the sacrificed animal. Pheidon had the clumsy obelos collected and replaced with coins, which the people called *obolos* in a slight linguistic shift. The next higher coin was then called *drachma*, which originally signified a »handful of roasting skewers.« Our Latin-derived concept of »obolus« comes from the »obolos.« Hence the creation of money as a quasi-religious act! Other sources, of course, cite a later moment of birth and another cradle. According to them, the Lydian king, Alyattes (ca. 619-560 B.C.) caused the first true coins to be minted in western central Anatolia. Hardly coincidental, it was also Alyattes who built the first permanently installed vending shops in history. He used electrum for his coinage, a naturally occurring alloy of gold and silver. The gold and silver content of these coins fluctuated widely, hindering their acceptance. For this reason his son, Croesus (560–546 B.C.), whose riches remain proverbial to this day, caused the first gold and silver coins to be minted. He guaranteed their content of precious metal. That is, however, what was passed on by Greek historian Herodotus. The Greek also let on that he was not much impressed by Alyattes' »new economy.« The religious link to coins – substitutes for cuts of meat from a sacrificial animal – was long preserved. In ancient Rome the coins in the temple of Juno Moneta, located today on the Capitoline Hill, were minted by priests.

We have the Chinese to thank for paper money. They also invented paper in the first century of our Christian era. The first historically documented paper money appeared during the first Tang Dynasty (618–907 A.D.), a flourishing political and economic period in China. It was certificates of deposit, namely receipts for precious metals held in custody for someone else. These receipts were executed by private persons and widely accepted as a medium of payment in trade. Emperor Hien-Tsung (808-821 A.D.) declared the issuance of these deposit certificates to be the privilege of his fiscal authority. The copper for his coin minting had supposedly become scarce. Possibly he was also looking for a new source of revenue, for the bearer of the emperor's deposit certificates had to pay interest. In return he could tender the certificates everywhere in the realm to imperial authorities as a credit toward payments. They were even accepted in meeting tax liabilities. This was the first government paper money in history. Regular issues of monetary notes then began with the Sung Dynasty (960-1279 A.D.). People spoke of »flying money.« Traders loved it. Foreign trade experienced an unexpected upswing. A specimen of this oldest surviving monetary paper note in the world is preserved in the money museum of the Deutsche Bundesbank in Frankfurt. It is a piece of blue-black colored paper, with dimensions of 34 by 22 centimeters, made from the pulp of the bark of the mulberry tree. The inscription shows it to be a »state banknote of the Ming Empire« worth 1,000 *cash*, as the monetary unit was called, and issued by the new Mongol rulers during the »era of the horrible war« (1368-1398). A whole bundle of these notes fell into the hands of the international expeditionary corps at the storming of Peking during the Boxer Rebellion. This occurred when a grenade shattered a statue of Buddha and the monetary notes concealed in its base spilled out.

In the description of his travels, the Venetian Marco Polo (1254–1324) was the first to report this invention of the Chinese. The first banks were developing in Italy at exactly that time.[2] Bills of trade and promissory notes were being executed in swelling numbers. They offered better protection against loss of assets in the extremely dangerous travel by land and water in those times, for in the event of a mishap or a robbery, gold and silver coins were lost. But promissory notes could not be cashed by unauthorized persons. These slips of paper with handwriting on them made their way to the farthest corners of the known world. They still were not banknotes. The dominance of coins would not change for centuries, despite the many forgeries and the deliberate manipulation and devaluation of gold and silver coinage. One still had to wait for Johannes Gutenberg and his invention of moveable type with reusable letters for printing before the Western world would make its acquaintance with the advantages of paper money.[3] The spread of paper money was rather sluggish even thereafter. An important stage on the way to the banknote was the founding of Amsterdam´s Wisselbank in 1609. It issued interest-bearing certificates against deposits and introduced a clearing system for drafts. Customer receipts for precious metals deposited and stored with the bank came later. When endorsed, they could be used in lieu of cash for the settlement of payments without money.[4] The mission and goal of this bank for bills of exchange was to promote payments traffic without cash. It is no wonder that the Dutch then played a leading role in foreign trade. The Wisselbank, however, was not permitted to extend credit. It was the English who took this step. King Charles I (1600–1649) – he was later to be beheaded for this – had his subjects' silver inventories that were stored in the Tower of London confiscated. He needed money again at that time to finance his Scottish wars. London's powerful goldsmiths thereafter took over the job of safeguarding, in their own storage vaults, the precious metal of their frightened clientele. That was more secure. On demand, they made out deposit certificates, »goldsmith notes,« for these deliveries. These were negotiable and could even be cashed in fractions of their face value.

Europe's first true banknote was issued in Sweden in 1661. People there were lugging around as pocket money copper plates weighing as much as 20 kilograms. At the suggestion of Johan Palmstruch of Riga, the Stockholms Banco issued banknotes denominated in silver or copper thaler. The bank, initially private and later government-run, soon became insolvent as a result of its excessive lending. This progression was to repeat itself with a certain regularity during the coming century. The right to issue paper money at that time still belonged to the banks, however. There was neither supervision of their issuing activities nor did they bother to coordinate the discrepancies in maturities of short-term (precious metal) deposits with mostly long-term lending. Therefore, insolvency was inevitable. The breakthrough for paper money in the form of banknotes came in 1694 with the founding of the Bank of England – the mother of all central banks – by a private investors' consortium. It was formed in response to yet another royal plundering of the Tower of London, this time organized by William III of Orange (1650–1702), who then occupied the British throne. He had been running short of money for his military campaign against the French. The private Bank of England was allowed to issue banknotes and extend credit, but it was obliged to maintain a certain coverage ratio to its own deposits of precious metal.[5] The »Bank of England notes,« issued against customer deposits and allowed to circulate freely, supplanted the goldsmith notes. Paper money had finally established itself. The crown was compensated with generous loans for the privilege granted the private Bank of England. Wars and the necessity to finance them were henceforth to be *the* driving force behind the triumphal march of paper money.

Paper money experienced its first, albeit short-lived, flowering on the continent at the beginning of the 18th century, thanks to the imagination and persuasiveness of, of all things, a professional gambler from Scotland in the service of the French. John Law of Lauriston (1671-1729) was a notorious philanderer, a card player with a phenomenal memory, and a financial genius all in one. Sentenced to death by a London court for manslaughter in a deadly duel but rescued with the help of influential friends abroad, Law surfaced in France when it was paralyzed by an economic crisis. Louis XIV, the sun king, had left behind for his subjects not only considerable territorial gains and monumental structures upon his death in 1715 but also a gigantic national debt. It corresponded to 25 times the yearly tax revenues. Not even a minimal interest payment on the debentures was possible. In a memorandum to the crown, the Scotsman recommended an expansive fiscal policy to resuscitate the economy. The volume of (paper) money should no longer be constrained by coverage with precious metals. Instead, the national assets, such as natural resources, population, and technology, should be invoked as the basis for measuring the volume of banknotes. This was supposed to serve as investment capital to develop France's overseas colonies, especially Louisiana in America. This would soon revive government financing and the economy in the mother country, Law promised the crown. With »national resources« as a yardstick there was no limit to imagination. Paper money could practically be issued at will. The Scot received a hearing with the regent, the prince of Orleans. Law took over all the outstanding national debt and promised to pay back the nearly worthless paper at its nominal value in precious metal when it fell due. All he asked in return was permission to found a private bank and the privilege of issuing his own banknotes. Even the share capital of this bank, Law & Co., could be subscribed partly with payment in government paper. His bank then indeed granted credit in great volume, divorced from its deposits of precious metals. This was the moment of the birth of money creation, of wealth based on paper. Goethe, also highly adept in economic matters, erected a literary monument to Law's monetary theory in his *Faust II.* The invention of paper money was presented there as a continuation of alchemy – the attempted conversion of lead into gold – by other means, and the process of money formation was subtly insinuated as masquerade.[6]

The Scot had promised the regent to make all citizens rich, and he also bequeathed to modern times the appropriate term of »millionaire.« His concept was so successful at the start that the court, in its perpetual shortage of money, hurriedly nationalized Law & Co., renaming it Banque Générale. It was exactly this initial success that fired up speculation with the bank stock issued by Law. The unavoidable collapse followed in train. The experiment of an imaginative Scotsman with his paper money failed because of the exaggerated profit expectations from the business with the overseas colonies and the indifference of his borrowers – including the many political enemies Law had made at the court – toward productive investments. Capital flowing in from England and Holland – »hot money,« one would say today – contributed substantially to the crash. Banque Générale went bankrupt in 1720 after three turbulent years. Law had to flee and died penniless in Venice a few years later. The French currency of that time was called *écu,* by the way. It's understandable that this name struck the experts as rather inappropriate for the European common currency three hundred years later. Also, because of that turbulence the topics of paper money and monetary stability have remained inseparably linked. The substantive erosion of the value of coinage had already enraged the Greek philosopher Diogenes in the third century before Christ. Coined money is a »dice game of politicians,« he fumed. The erosion of value through public mismanagement also marred the introduction of paper money, for both absolute rulers and democratically elected politicians have treated the »government's pledge of value,« which was necessary to make paper money a generally accepted payment medium, with downright carelessness in the sweep of centuries. Paper money was to shed its value even more quickly than money coined of gold and silver. The scandal with Law and his bank, by the way, had devastating consequences for Europe, dragging half the continent down in tow. France's economy would not recover from the shock until many years later, when the French Revolution broke out and the new rulers of the country nationalized church property as a way of meeting the tremendous costs of the revolution and its wars. Therefore, interest-bearing payment drafts, called *assignats,* were issued in great volumes in anticipation of the proceeds expected from the sale of the confiscated church assets. Creditors had to accept this paper in lieu of cash. The idea perhaps was not ethical but it was financially sound, since the assignats were backed by assets, the clerical lands. The French economy slowly started to recover after decades of stagnation and destitution. But this recovery was brief. Mismanagement and corruption reduced the proceeds from the sale of nationalized property far below expectations, devaluating the assignat. In addition large quantities of counterfeited assignats, printed by the royalist émigrés in Great Britain with the expressed blessings of William Pitt´s government and brought to the continent as contraband, were flooding France. After a few years the assignats were not even worth the paper they were printed on. The last bit of confidence in paper money was destroyed. The lasting preference of Frenchmen for gold as a store of value has been attributed to those bad experiences with Law's paper money and with the assignat.

The decisive chapters in the history of paper money were actually written in the New World, in the »land of unbounded possibilities,« where even a »tobacco-leaf currency« had circulated widely since the first third of the 17th century.[7] The tax burden imposed by the British colonial rulers rose steadily there. The scarcer precious metals – and therefore money – became in America, the more strident became the demands for independence from Great Britain. Even playing cards cut into pieces served at times as a substitute for money. Benjamin Franklin, whose portrait today adorns the 100-dollar note, had already called for more freedom for the colonies in the printing of paper money in an essay in 1729. Franklin was a printer by trade, which might also explain his interest in paper money.[8] London's repeated refusal to consider these demands and the issue of paper money by banks on their own authority in the insolent colonies then contributed to the outbreak of the American Revolution in 1775. Independence was won, but monetary stability was frittered away. The massive issuance of paper money by the Continental Congress to finance the revolutionary army – diluted by the massive printing of counterfeit money by the beleaguered colonial rulers – ended in hyperinflation. Between June 1775 and November 1779, it authorized no fewer than 42 dollar issues for a grand total of 241.6 million dollars, an incomprehensible amount in those days.[9] The loss of value of the *continental*, the currency of the breakaway states – even became a saying: »not worth a continental,« it was said in derision.

It took a long while before the independent United States of America struggled back to monetary stability. Decades of uncontrolled issuance followed. There were paper monetary notes from thousands of local – sometimes tiny – banks, and a rising tide of counterfeits of these simple notes. »Wildcat banks« were what ordinary people called those banks that carelessly printed banknotes and cared little about their backing by precious metals. Their headquarters were concealed so that only a wildcat could find them, the citizens complained. But one could only exchange the paper money for gold or silver at those main offices. The government was divided on the matter of whether the central government would have to take over the issuance of banknotes and guarantee their value. A bitter dispute about this raged among politicians during the first half of the 19th century. The flood of dollar notes, genuine and phony, backed by gold and silver or not, was enabling the immigrants flooding into the United States from Europe to purchase property, making possible the settlement of a vast, nearly empty country. Not until 1863 did Congress suspend the – often fictitious – convertibility of all these circulating banknotes and ordain with the National Banking Act the introduction of uniform national banknotes, entrusting their issuance exclusively to the Treasury Department. This was the moment the greenback was born. It was named after the dominant green color on the reverse side of the dollar notes.

All this did little good for the idea of the banknote. Its range remained limited, at least in Europe. Initially that was quite in line with the interests of the issuing banks. They, of course, had to pay out the equivalent value of a tendered note in precious metal on demand. »I promise to pay the bearer on demand …,« is printed even today on British banknotes, although one cannot envisage anymore a disbursement of pieces of gold in exchange for the proffered paper note. The fear of counterfeiting was already great in those days and the production of banknotes was expensive. Smaller denominations of notes would have a destabilizing effect in the event of a crisis because of their greater proliferation, it was feared. The banks avoided the issuance of notes with low face values. Banknotes remained the privilege of commerce and the more prosperous classes of society. The Bank of England was even forbidden by its by-laws until 1793 to issue banknotes with face values of less than 20 pounds sterling, a considerable amount at that time. In rural France people still got along largely without paper money through the end of the 19th century, paying with coinage instead. The Banque de France didn't issue its first banknote of less than 500 francs – the annual wage of a worker at that time – until 1847. And in the German Empire the issue of a Reichsbank note that was less than 100 marks did not occur until 1876. A Reichsbank director still could complain at the beginning of the 20th century that the wary German people have to be forced to make use of paper money.

Paper money by then had long since established itself even in Europe, for, after the Napoleonic wars, more and more countries had taken the production of paper money into their own hands, declaring their paper monetary notes alone to be »legal tender« – while the precious metal backing was reduced in stages and then entirely abandoned. Henceforth, every citizen – and the government – would have to accept paper bills in redemption of debt, although the citizen was not obliged to use them for other payments. Even the obligation to accept the legal tender, both coins and notes, is not really compulsory, however. The legal department of the European Central Bank cites an example of a justifiable refusal: if the creditor had unilaterally announced certain payment terms before the contract was made, if he and the prospective customer had previously agreed upon compensation other than cash payment (check, EC debit card, money transfer), or if the payment offered would violate recognized principles of reason and fairness. The airline ticket to a tropical vacation paradise cannot be paid with the contents of the piggy bank, however well fed with coins it might have been. In any event, recurring bursts of inflation have weighed heavily upon the reputation of paper money. For example, Germany was literally inundated with worthless emergency banknotes during the period of hyperinflation after the First World War. In the most extreme form these ended up printed on one side and posted in notebook binders. The final break with the era of gold backing came in 1971, when U.S. President Richard Nixon, in order to avoid a devaluation of the dollar, dispensed with the obligation to exchange dollar balances for gold. By that time, this obligation had still only existed toward central banks anyway. The last hurdle on the way to the printing of *fiat money* was cleared. Paper money merely offers the authorities a still cheaper way to cheat the people than had already been the case with coinage, railed liberal national economist and Noble laureate Friedrich A. von Hayek in his later essays. The best thing is to abandon it again, he said.[10]

The Chinese, the inventors of paper money, had briefly toyed with this thought in the 13th century. Counterfeits were appearing too frequently. »Anyone who turns in a counterfeiter to the authorities will receive a reward and the confiscated assets of the perpetrator« was printed right on the cash notes mentioned. Thus, the Chinese also simultaneously came up with the punitive sentence. It is quoted on banknotes in watered-down form to this day. But the genie was out of the bottle. Trade and development had become too easy with (paper) money. No one would like to do without it anymore, not even Karl Marx and his disciples. Vladimir I. Lenin, the father of the socialist revolution in Russia, had to »postpone« the planned abolition of money. It was supposed to be officially abolished when Soviet citizens were so richly supplied with all the goods for their daily needs that they no longer needed money as a medium of exchange. That socialistic paradise never became reality. Not even a utopian revolutionary like Mao Tse-tung could envisage a life without banknotes. When his soldiers finally reached their refuge in the loess caves of Yunnan at the end of their casualty-strewn Long March straight across China, the printing of their own renminbi people's currency was among the first administrative measures of the newly proclaimed socialist state of workers and peasants. Since there was no paper, they helped themselves to linen cloth. Cut into small rectangular pieces, this cloth was printed on one side as revolutionary money. The paper money collection of the Hypovereinsbank in Munich owns several of these linen-cloth banknotes.[11] The only serious attempt to do without this »symbol of capitalist exploitation« is passed on from the »Stone-Age communism« of Pol Pot. When the Khmer Rouge took power in Cambodia in 1975, as eye-witnesses reported, they broke open the vault of the central bank, threw bundles of banknotes out the windows, and reveled in the sight of freshly printed notes sailing on the wind through the streets. Even they later came to their senses. Yet before these communists got around to issuing their own banknotes, the neighbor from communist Vietnam put an end to their bloody regime.

The value of banknotes is not just measured in numbers. Banknotes are the calling cards of governments, even the bearers of subtle political messages.[12] Business travelers and tourists size up the unfamiliar paper money in their hands upon arrival abroad, unconsciously getting their first impression of the unknown that awaits them. In many countries banknotes have become the symbol of national identification and an integration factor. The greatest artistic, aesthetic, and technical care is lavished on their preparation for this reason as well. The Finish state bank, Suomen Pankki, for example, chose an aspect of the monument the Finns had erected in the center of Helsinki to Alexander II, the Russian czar, for their 20 Finn mark note in 1897.[13] It was a hidden message to Nicholas II, the czar then reigning in St. Petersburg, not to interfere with the autonomy granted by Alexander in 1809 to the (Russian) grand duchy of Finland. Kaiser Wilhelm II was less subtle in these matters. He not only adorned his 1908 banknote issue in the 100-mark denomination with a wary-looking Germania under a German oak, her hand menacingly on the hilt of a sword; on this note he also had a formation of battle ships martially steaming through the seas of the world to serve notice that the German empire would advance to become the world's second-largest sea power.[14]

Banknotes as symbols of the issuing countries are also regularly examined by the central banks for authenticity and physical condition, on average three times a year. This procedure occurs fully automatically at least in the European common currency sphere and guarantees a uniformly good condition of euro banknotes in all twelve member countries – or at least it is supposed to. Even the health of banknotes, their hygienic condition, is tested continually and in strict secrecy in laboratories. Out of concern about carcinogenic substances, for example, the central banks had the usual animal gelatin for the surface coating of banknotes replaced with synthetic products. This prolonged the longevity of the banknote – and raised the bacterial contamination of paper money. Nevertheless, the spread of AIDS viruses with banknotes belongs in the realm of fables. Also China's concern in early 2003 that the deadly SARS virus could be spread by banknotes could more easily be explained by the general hysteria than with laboratory findings.[15] Nevertheless, the Bank of China systematically sequestered all surrendered banknotes for 24 hours, the assumed life span of the SARS virus, before putting them back into circulation. Naturally, bacteria and viruses can also be transmitted by a banknote, but that is more likely to happen from contact with a door knob that has just been handled by an acutely diseased person. The hygiene test conducted by a Bristol institute in 1999 did reveal that 99 percent of the used notes it had been furnished by the Bank of England showed traces of cocaine. Lest anyone get the notion that the absurd price spikes of the IT-bubble may have been the crazed handiwork of habitual coke sniffers in the City, the Bank of England intervened. It was not so much the cocaine dusting but rather that a few of the very dirty notes would have contaminated the sorting machines, it was said in a hastily drafted press release from the Old Lady of Threadneedle Street, as the Bank of England is called with good-natured irony.[16] By high summer of 2002 this »machine contamination« had apparently spread to Germany. A test conducted by the Institute of Biomedical and Pharmaceutical Research in Nuremberg showed that nine of ten euro notes it examined exhibited cocaine residue.[17]

Even if a banknote were »contaminated,« one ought to think twice about destroying it. When a famous courtesan of the court of Louis XIV tried to display her wealth by devouring a promissory note worth 500,000 francs at a party one evening, the courtiers worried only for the financial health of her benefactor. But when the French chanson singer Serge Gainsbourg torched a 500-franc note before running television cameras in 1984 to protest what he regarded as excessive taxation of his income, an outcry reverberated through the republic: Sacrilege! A hail of charges ensued. Gainsbourg went unpunished. The law that prescribed punishment for such willful destruction had just been repealed by court edict. The fractious bard would not have gotten off so easily in the United States of America. The deliberate destruction of a greenback there amounts to an insult to the national pride. The Deutsche Bundesbank is more tolerant. The loss of an asset by willful destruction of a Deutschmark note would be punishment enough for the perpetrator, it said laconically when asked. Nothing of this pragmatic stance has changed under the aegis of the European Central Bank.

Ideologues haven't succeeded in putting the coup de grace to cash. Yet the issue of the future of money, particularly the banknote, has not gone away. What has been commonplace for centuries needn't apply forever. Experts in many central banks and research institutes brood over the question of what volume of paper money might still be needed in coming years. The threat comes from two directions: from counterfeiters and from alternative payment instruments. Ever more sophisticated and cheaper devices for high-tech reproduction – PCs, scanners, and color printers – are available to those who would copy money. These can be mixed and matched to suit individual requirements. With them the forgers can make, as needed, copies of notes of a quality that would have been inconceivable twenty years ago. The future of the banknote as a payment medium rises and falls with the unshakable trust of the citizen in the security of his banknotes. The greater the exertion to heighten security against copying, the higher the production costs of the banknote. The manufacture of money consumes money – the money of the taxpayer. It is obviously more and more important to make paper notes with the greatest security, but at acceptable costs.

Recommended again and again as an approach to cost suppression has been the replacement of banknotes of paper with those of plastic polymers. Haiti made a beginning with plastic notes in 1974. These were produced by American Banknote, which has since dropped out of the ranks of banknote printers. It was a glorious flop. The printer's ink rubbed off completely in a matter of a few weeks in the humid tropical climate. The notes had to be pulled from circulation. Another twenty years elapsed before Australia switched completely to plastic, this time a polymer substrate, for its banknotes. Since then nearly a dozen countries in the torrid zones have at least experimented with issuing such a polymer note. Those countries include Brazil, Brunei, Indonesia, Mexico, Papua-New Guinea, Romania, Taiwan, and Thailand. Even socialist Vietnam is currently converting all its banknotes to polymer notes. The conversions were often done with help from the Australians, who wanted to export the polymer substrate in order to defray the extra cost of its production costs with the additional demand. Polymer notes cost considerably more to make. But they also have a substantially longer longevity than paper money, making them cheaper in the end. At least that's what is said by their proponents, principally the petrochemical industry that serves as the supplier. The opponents of plastic money counter that for security reasons a plastic banknote cannot be kept in circulation as long as the material would otherwise allow and would be necessary also to amortize its cost. The destruction of the huge mountain of plastic banknotes that are no longer suitable for circulation each year would also become an environmental problem. Naturally, it is especially the manufacturers of secure paper who are leading the charge against plastic notes – and they double as the leading private printers of banknotes. For purely aesthetic reasons, in any event, plastic notes are a nightmare. They feel like recycled Aldi discount grocery bags, an observation made not just by the business magazine *Wirtschaftswoche.*[18]

The second threat to the banknotes arises from the alternative instruments of payment. The more harmless challengers appear in the form of economic alternatives rooted in local civic pride. All around the world, in Australia, Brazil, England, France, Germany, Japan, and the United States, thousands of organs are sprouting that promote their own »local money« by taking clever advantage of legal loopholes. Services there are redeemed in coupons under a fixed system of valuation. Local tradesmen accept the coupons as a payment medium. This is supposed to stem the outflow of money, stimulating the local economy and spawning jobs. Legal tender is not supposed to be abolished, but merely complemented.

A more serious challenge that is hard to measure is posed by the electronic age and »e-cash,« electronic money or »e-money,« e-commerce, and Internet banking. There is no shortage of forecasts of the end of the banknote. At a Washington conference in the mid-1990s a representative of the Federal Reserve Bank of Cleveland had already predicted that money would one day be replaced by electronically actuated account movements, much as precious metal backing once was by paper money. The speaker even foresaw the possibility that e-money created by private entities could one day compete with the coins and banknotes issued by the governments.[19] It was reminiscent of the debate two hundred years ago in America over the role of government in emitting paper money. In historical retrospect money has steadily lost its physical substance, something also confirmed by the Deutsche Bundesbank in an extensive study on the subject.[20] Cash transactions now make up only 5 percent of the whole payments traffic in Germany.[21] Why, then, have paper money, if there can be access to the balance of a bank account in real time, if e-commerce instantly makes possible price comparison and purchase and if the plastic card or Internet banking enable the payment of any purchase without problems? Compared with more than 2 trillion dollars – a 2 with 12 zeroes – in virtual accounting money that darts daily around the planet by cable or satellite, the 200 billion pieces of issued banknotes do not seem very impressive today, regardless of how large their denomination. Banking and commerce are no friends of cash. They would only too gladly dispense with it because the handling of money costs them a lot of money. Sorting, checking, and counting – this work has to be done daily. The accrued cost amounts to tens of billions of euros in the Euro-zone alone. Yet, in their initial euphoria, the purveyors of Internet services underestimated the problems of payment. Electronic payment has to be »user-friendly« and, especially important for the customer, it has to be safe from abuse. The damage done by fraud within Internet banking and electronic payment systems far exceeds the losses from forged banknotes. These issues have defied a technical solution thus far. The moment one can pay without pulling a crispy banknote out of a wallet still seems to lie in the distant future. Money is just as much a social contract as it is an object or a technology, warned another speaker at that same conference. Its utility in a given form depends entirely upon the general acceptance of that form.[22] And this form is still the banknote of paper.

Banknotes have cogent arguments on their side. They are incomparably cheap in daily use because there are no service charges attached – at least none that the customer notices, even if they are heaped upon him in the opaque pricing of the product he obtains. They offer him a high degree of security because no computer hacker can eavesdrop on the transaction and clean out his account. They can be used (nearly) as often as one cares to. And they are absolutely anonymous because banknotes leave no trace – much to the chagrin of the internal revenue agency. Surveys in Europe and overseas unanimously confirm that the citizenry clings stubbornly to its payment habits with paper money. Widespread fears of potential abuse, plus ignorance and indifference, as well as the cost of additional safeguards for the connection between the card and the net, have so far obstructed the breakthrough to electronic money. The Bundesbank study mentioned here did indeed show that only 67 percent of the turnover in German retailing was still paid in cash in 2002, compared with 79 percent in 1994, while in that same period the share of purchases made with card-based instruments rose from 6 to 29.5 percent. Yet, this growth was attributable to the »pay-now« debit card, which is now equipped with the personal identification number (PIN) just as the EC card. In 2001 more than 1.2 billion transactions worth nearly 90 billion euros were settled with such debit cards, meaning that the number and value of transactions with debit cards had doubled in just four years. The »pay-later« credit card, on the other hand, had a much harder time because of the tedious examination of credit-worthiness, awkward settlement, and high additional costs for overdraft interest. Compared with the debit card, it rolled up only one-third the turnover value, accomplishing that only thanks to its popularity in flight and hotel bookings. The share for the »pay-in-advance« cash card, onto which the user has to transfer an amount from his account, is now so small that it plays no role in the statistics.

The question is not whether there will still be paper money in the future but rather what future role banknotes will play in modern life and what reputation they will then have, concluded Thomas A. Ferguson, director of the Bureau of Engraving and Printing, in his presentation.[23] The sensuous feel of cold cash in the hand will sustain the banknote for a long time to come, believes Ferguson, whose government printing plant after all prints the world's reserve currency, the dollar. It will take a while before electronic money replaces the banknote and central banks start issuing virtual e-money instead of crisp banknotes.