

ALSO BY JACK WEATHERFORD

Tribes on the Hill

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The History of Money

From Sandstone to Cyberspace

JACK WEATHERFORD

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Amerigo Vespucci (1451–1512), inspired the names of the two continents that constitute the New World. Vespucci was one of many Florentine merchants who traveled and explored the world. Soon after Christopher Columbus opened a route across the Atlantic, Vespucci joined an expedition that reportedly visited the coast of what is now Brazil. In his writings, Vespucci made many wild claims about places that he said he had visited but that, in reality, he probably never actually saw. His maps and writings circulated widely, leading a German cartographer to apply *Americus*, the Latin form of Vespucci's first name, to the newly discovered southern continent that was thought to be completely separate from the places seen by Columbus farther north. Soon, cartographers applied the designation to the new northern continent as well, giving us the new names North America and South America. In all the world Amerigo Vespucci is the only person ever to have even one continent, much less to two, named for him, and he too was a Florentine merchant.

With the rise of Italian banking and the Renaissance, a new type of civilization began to emerge. It was marked by novel ways of thinking and new ways of organizing commercial life. By themselves, the bankers and their new monetary system would not have been able to create a whole new civilization, but the changes that they introduced into European life were followed by a unique event in world history. With the expansion of European hegemony to the Americas, the Europeans acquired more wealth than any other people had ever possessed. The new wealth combined with the new financial institutions created a unique hybrid system of banking that dominated the world for the next five hundred years until the First World War.

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The Golden Curse

*Make money, money by fair means if you can,
if not, by any means money.*

—HORACE

THE QUECHUA INDIANS, WHO DIG MINES AND EXTRACT the minerals from the Bolivian Andes, toil beneath the ground in a twilight world of fluttering light ruled by the devil and his wife. Only the devil holds the power to grant or deny money, success, and wealth to the miners. Aboveground the miners pray to the Virgin Mary and the saints for help in solving problems of health and love, but they go to the dark altars inside the mines to ask for favors from the devil and his consort. The Virgin Mary and the saints control the water above the earth and thus the crops, the animals, and fertility, but since money is derived from the gold and silver that come from the devil's domain in the bowels of the earth, only the devil and his wife can bestow it on humans. In some respects, the devil of the Bolivian miners resembles the Greek god Pluto who, as ruler of the underworld, had the power to distribute its metals and was thus also the god of wealth.

Deep inside the caves, the miners erect altars to the devil, whom they call El Tío, "the Uncle," and to his wife, China Supay. Statues depict him with large, twisted horns rising up from his head and with bulging, bloodshot eyes popping out of their sockets. Mulelike ears flare out from his head, and two long black tusks rise from his lower jaw. His other teeth are usually sharp daggers made from strips of mirrors that reflect what little light there is in the dark cave, giving the devil a smile that sparkles with menacing ferocity. He wears a large

crown topped with a snake or a rampant lizard, whose mouth is open and twisted in what seems to be a scream of rage. The statue of the devil usually stands next to the rather plain figure of his wife, who has a broad moon face and a deep red complexion, and who looks somewhat like the Bolivian women one sees scurrying along the streets aboveground.

The miners make regular supplications before the images of El Tío and China Supay. They offer candles to the lords of the underworld, and each miner brings a daily offering of a cigarette, a libation of alcohol, or some coca leaves for the devil and a lump of sugar for his wife. In special rituals of appeasement during times of earthquakes or tragic cave-ins, large sacrifices such as sheep or llamas must be made. In such sacrifices, blood is scattered around the altar, and the shaman pulls out the pulsating heart of the sacrificial animal to spray blood in the four sacred directions of Inca cosmology. This act forms a contract, or *k'araku*, between the worshiper and the deities. In return for the offering, the devil will grant the miner life. Such sacrifices usually occur in August, the devil's sacred month, when the miners traditionally buy their equipment and supplies for the coming year. Sacrifices to the devil also abound during the pre-Lenten carnival season, when normal restraints are loosened.

According to local lore, some greedy petitioners want more than just life, more than just the sustenance to get through another day's work. They want true wealth. To get such riches, the petitioner must bring a very special offering of a fellow human being who is sacrificed in the same way as a llama. Whenever the body of a person, almost always a previously healthy young man, shows up on the mountains near the mines, and especially if he has any unusual marks, the Indians say that he was sacrificed to the devil and China Supay. Such a *k'araku*, a golden contract, with the devil would be made only for money.

For nearly five centuries, the Indians of Bolivia have mined the greatest silver deposits in the world, and for five centuries they have remained among the poorest people on earth. It is little wonder that, for them, a magical curse must be associated with the mining of silver, the minting of coins, and the making of money. All around

them, the Indians see ample evidence of the success of the curse and pacts with the devil. They point to historical evidence such as the killing of the last Inca emperor, Atahualpa, by Pizarro, who then inherited all the wealth of the Inca Empire. They point to countrymen who have made millions of dollars in the cocaine trade and who could have done so only with the help of the devil and his wife. How else could these uneducated men have defied all the efforts of the Bolivian army and the sophisticated technology of the U.S. government to capture them? Even in their own lives, the miners know that they risk sacrificing themselves to an early death by accident or from the ravages of poverty, while others, who live far away and never work in the mines, live the luxurious lives of millionaires. They insist that such inequities in wealth can be explained only by magic and special sacrifices to the devil.

TREASURES OF THE AMERICAS

After Columbus arrived in America in 1492, it took the Spaniards approximately fifty years to locate all the major treasures accumulated by the Indians. The Spaniards looted the great Aztec capital Tenochtitlán in 1521. Soon thereafter they raided Central America and conquered the Chibcha people of Colombia, the original El Dorado, before moving on to battle the Incas in the 1530s. The Spaniards melted most of the gold and silver immediately so that it could be made into ingots for efficient shipment back to Europe. They saved some of the more unusual pieces, such as a giant sun made of gold and some of the gold and silver plants from the Inca emperor's garden, and shipped these back to Spain to give the king some idea of what kind of country they had captured for him.

One description of these Indian gold and silver treasures survives. The German artist Albrecht Dürer visited an exhibition of the captured American treasure on display in Brussels and wrote, "I saw the things which have been brought to the king from the new land of gold, a sun all of gold a whole fathom broad, and a moon all of silver of the same size. . . . All the days of my life I have seen nothing that rejoiced my heart so much as these things, for I saw amongst them wonderful works of art, and I marveled at the subtle *ingenia* of men

in foreign lands."¹ Soon after the exhibit, royal officials ordered that the gold and silver be melted in order to mint coins.

After half a century of constant looting, the Spaniards ran out of rich Indian nations to conquer. In need of new sources of riches, they turned their attention to the source of the silver and gold—the mines. In Mexico and Peru they found more deposits of silver than the meager mines of Bohemia and other European sites had ever produced. The Spaniards immediately expanded the mining of these deposits, and the silver mines of Mexico and the Andes made Spain the richest nation on earth, but these riches came at what ultimately proved to be a very high price for Spanish society and culture.

The two primary centers for mining in America arose in Zacatecas, New Spain (Mexico), and in Potosí, Upper Peru (now Bolivia). Through the centuries, the two colonies jockeyed for the lead in silver production, their position depending on the discovery of new mines and the introduction of new technology. Despite variations in production, America remained the greatest source of silver in the entire world throughout the Spanish colonial era.

As early as 1536, only fifteen years after Cortez's conquest, the Spanish government established a mint in Mexico to make coins from the vast deposits of silver. Colonial officials applied for royal permission to begin issuing coins in other parts of the Americas, and the king granted permission to establish mints in Lima (1568) and then in Potosí (1574).

At that time, Spain owned the Americas, except for the easternmost territory of South America, which became Portuguese Brazil. The monarchs owned the land by virtue of a papal bull backed by the Treaty of Tordesillas signed on June 7, 1494, by Castile and Portugal. As God's spokesman, the pope could assign such lands as he saw fit, but in addition to the backing of God, the two powers held the land by right of discovery and conquest. This gave them several theoretical layers with which to enforce their claim. With the backing of God and the pope, the Spaniards and the Portuguese did not need to enact the charade of signing treaties with the native peoples themselves, as the English and other European powers later felt compelled to do in order to make their rule legitimate.

Under the laws of Castile laid down by Alfonso X and Alfonso XI, the monarch could grant ownership of land to individuals, who could then buy and sell such lands. No matter who owned the surface rights to the land, however, the Crown continued to own all mineral resources in perpetuity. Additionally, the Crown demanded payment of 50 percent of any buried treasure discovered in Indian tombs, pyramids, and temples.

The monarch owned many of the mines outright, but for a high enough fee, the Crown's agents would lease, grant, or even sell to individuals and groups the right to mine the resources. Even after such a sale, however, the Crown continued to collect a fee called the *quinto real* (the royal fifth), or 20 percent of all silver and other minerals; the percentage decreased in later decades. Even though the *quinto real* supposedly allowed 80 percent of the silver to remain in the hands of the mine owners, the government enacted restrictive laws that took away much of that as well. The miners had to buy from the royal government all of the mercury and other substances needed for the mining process. The royal government also exercised a monopoly on the trade of salt, tobacco, gunpowder, and most minerals.

The Spanish Crown acquired further profits from mining through the supplies shipped from Spain. These came from a government monopoly that charged the colonists exceptionally high prices, and of course the goods had to be shipped in government-controlled ships in government-organized convoys, adding even more to the cost of the goods. On every transaction in Spain, there was a sales or gift tax called the *alcabala* that gradually increased over time from 2 percent to 6 percent. This tax had to be paid on any transfer of goods whether by barter, sale, or gift; the king exempted only the clergy from it. In 1572, the government extended the *alcabala* to include all the Spanish territories in America. In addition to paying the same taxes as people in Spain, the Americans had to pay the *almojarifazgo*, a 7.5 percent import tax, on all goods shipped from Europe.

The Spanish government also collected the *diezmo*, or tithe, for the church, with the officials keeping a portion of it as a collector's fee. This *diezmo* did not apply directly to the output of the mines,

but it did apply to all agricultural products, including those used to supply and feed the miners. Indians, whether they worked in the mines or not, were forced to pay special tribute taxes in the form of silver coins.

A minimum of 20 percent and perhaps as much as 40 percent of all the silver shipped to Spain from the Americas went directly into the government treasury.² The remainder went into the pockets of assorted government officials and various aristocratic families who owned rights in the American mines.

To keep the silver flowing, Spanish officials completely reorganized the social life of the native peoples. Upon arrival in Mexico and Peru, the Spaniards found a number of Indian societies of peasants growing crops and paying taxes and tribute to local chieftains and a central ruler. They quickly changed these independent nations into colonies organized around one single activity: the mining of gold and silver. Agriculture was important to the colonial authorities in that it produced food for the miners, who could not stop mining to grow their own crops. Ranching was important in that it produced horses, mules, and oxen for transport to and from the mines and cows for dairy products and meat. Roads were important because they allowed for easy transport of materials and men to the mines and silver to the coasts for shipment across the sea.

Prior to the arrival of the Europeans, the production system of Indian America had centered around the family, but under Spanish administration, the hacienda became the primary focus of the production of food, men, and animals for the mines. The very name *hacienda* was derived from the Spanish *hacer*, meaning "to make," referring to all the things produced on these estates. The peasants attached to the haciendas grew the crops and raised the animals that would feed the miners; they produced the mules, donkeys, burros, and oxen need for transportation to and from the mines. They tanned the leather to make saddles, aprons, tethers, ropes, lashes, whips, and the other accoutrements for work in the mines. They chopped down the trees for mining supports and gathered the firewood and made the tallow for the torches used in the mines. They made the sacks used to haul the silver down to the coast, and they supplied the ships

with the food and material needed for the return voyage to Spain carrying their heavy cargo of silver bars.

THE BRIDGE OF SILVER

The wars and struggles among the European powers from the sixteenth through the eighteenth century focused on controlling the wealth of the Americas and the trade with Asia. First Spain struggled against Portugal, and then they both struggled against England, France, and the Netherlands.

From 1500 until 1800, the mines of the Americas provided 70 percent of the world's output of gold and 85 percent of its silver.³ The amount of gold and silver extracted from the American mines increased in each century as new deposits were discovered from Canada to Chile. Even as late as the beginning of the nineteenth century, when the Spanish colonies were poised for independence, Mexico alone produced half the world's annual output of silver.

The Indians who worked the mines had no way to measure the amount of silver that they produced for shipment abroad, but oral tradition maintains that they mined enough silver to build a bridge from America to Spain. The precious metals poured forth out of the mines and away from the Americas at a rate unprecedented in the history of the world. Spanish galleons transported the gold and silver from the Caribbean to Spain, and from there, merchants of many nations distributed it throughout Europe and the Mediterranean. From Acapulco each year, the Manila galleon sailed with its cargo of silver for the Spanish colony in the Philippines, and from Manila, other merchants traded the silver up and down the Asian coast from Siam to Siberia.

Outsiders have attempted to estimate how much wealth the Spaniards and Portuguese took out of the Americas. The colonial powers, of course, went to great effort to keep the amounts secret, causing much scholastic effort to have been spent gathering and evaluating records from around the world. Researchers have measured the amount of ore mined and the amount of metal extracted. They have compared it with the food provisions for the miners and with the amount of mercury used in the treatment of ore. They have com-

pared shipping records with the arrival records in Europe and, most importantly, with the records of the Casa de la Contratación, the bureau in charge of Spanish shipping. Scholars have dug through records, some of which were falsified, and have tried to determine how much gold and silver was pilfered or shipped illegally.

Based on all of these methods, a range of estimates has emerged. Historians calculate that from the European discovery until 1800, between 145,000 and 165,000 tons of silver were shipped out in addition to 2,739 to 2,846 tons of gold. At the price of \$400 per ounce, the total gold production would have a value of approximately \$36 billion.⁴ Even these numbers, however, cannot convey the significance of such an amount of gold and silver. In an age without paper money, the introduction of this much specie into the monetary system had an effect that would be difficult for us to imagine.

The Portuguese colony in Brazil lacked the silver of Mexico and Peru. Portuguese officials never derived as steady a flow of wealth from their colony as the Spanish did from theirs, and the Portuguese monarchs and aristocrats largely ignored Brazil in the early years in favor of their more lucrative spice trade with India and the Spice Islands. For the Portuguese government, Brazil remained a secondary colony that produced cheap sugar and bought many slaves but supplied few of the exotic goods provided by the colonies in Africa and India.

Portugal's indifference toward its American colony ended dramatically in 1695 with the first of a series of Brazilian gold booms. Prospectors found that some sections of the flat, alluvial soil of Brazil harbored rich deposits of gold flecks and nuggets, the extraction of which required much work but relatively simple technology. The district of Minas Gerais (General Mines), north of Rio de Janeiro, became the center of world gold production. Unlike the Spaniards, who relied mostly on Indian labor to work their mines in Mexico and Peru, the Portuguese imported African slaves to work theirs. The Brazilian emphasis on gold mining became so obsessive and so important in the colonial economy that the Portuguese authorities made it illegal to engage in any enterprise in Minas Gerais that did not relate to or promote gold mining.

Gold production in colonial Brazil climbed to its zenith in the two decades between 1741 and 1760 when it averaged more than 16 tons a year (14,600 kg).⁵ The mining and transport of gold required the work of some 150,000 slaves, approximately half of the total population of Minas Gerais.

Prospectors discovered other gold deposits and even precious gems farther west in the provinces of Goiás and Mato Grosso. To the flow of gold, the Brazilians added approximately three million carats of diamonds for the treasury of the Portuguese kings.⁶ In the search for gold and gems, the Brazilians pushed ever deeper into the continent and eagerly passed far beyond the line established in the Treaty of Tordesillas to separate Portuguese from Spanish colonies.

THE PRICE REVOLUTION: FROM RICHES TO RAGS

While the Spanish kings squandered their wealth on foreign adventures and wars, the Portuguese kings squandered theirs on palaces, pomp, and pageantry. The rulers wasted money on sumptuous excesses and poured money and gifts into the hands of their relatives, lovers, and other court favorites.

The wealth proved to be a mixed blessing for the governments and peoples of Spain and Portugal. It caused tremendous inflation—the more silver people had, the more goods they wanted to buy, and the more people who wanted these goods, the higher the prices charged for them. The quantity of goods produced could not keep up with the volume of silver shipped from America; consequently, inflation increased, thus eating away at the value of the silver and gold. Writing in 1776, Adam Smith noted that “the discovery of the abundant mines of America reduced, in the sixteenth century, the value of gold and silver in Europe to about a third of what it had been before.”⁷ It is estimated that between 1500 and 1600, the first century of Spanish colonization of the Americas, prices in Spain rose by 400 percent, and for this reason these great changes are known as the price revolution.

Although this phenomenon of inflation amazed and annoyed people, they seemed to understand it quite clearly. As early as 1556, Martín de Azpilcueta, a professor at the University of Salamanca,

compiled a list of reasons why the value of money changed. The most important reason was that "in times when money was scarcer, salable goods and labor were given for very much less than after the discovery of the Indies, which flooded the country with gold and silver."⁸ This was later amplified and explained in more detail by the French political economist Jean Bodin. A special commission, the Junta del Almirantazgo, issued a report in 1628 blaming the poverty of Spain on the riches from the Americas. The report stated that the "Indies have been the cause whereby these kingdoms find themselves with few inhabitants, no silver, and a burden of commitments and expenses, serving as a bridgehead for the transfer of silver to other kingdoms, all of which would have stayed in these if what went to the Indies were of our harvesting or manufacture."⁹

Spanish farmers, ranchers, craftsmen, and manufacturers produced few goods; so they had to be imported from other countries, adding even more to their cost and hastening the flow of silver out of the country to the point that it left nearly as fast as it arrived. Italy sold them glassware, Hungary sold copper, England offered woolens, and the Netherlands offered weapons. So much silver was being exported by Spain that even its shipment became difficult to arrange; foreign shippers soon had to step in because most of Spain's ships were occupied in the transportation of silver from America to Spain.

The Spanish monarchs had exacerbated their financial situation by expelling the Jews and Muslims in 1492, the same year that Isabella and Ferdinand united the country and Columbus made his first voyage to America. Most Christian Spaniards at that time worked as peasants tilling the soil, growing wheat and olives, and raising cows and goats, or else they served as soldiers. Whether soldiers or peasants, they had little education; they could not read and write, nor could they work with numbers. The Jews and the Arabs had constituted the educated class of administrators and merchants; without them, the Spaniards proved highly ineffective in managing their financial and commercial affairs. People of many nations rushed in to help the Spaniards. Italian merchants, German moneylenders, and Dutch manufacturers quickly moved to fill the mercantile void left by the Jews and Arabs, but they took their profits back to their home

countries. Without a native merchant class, the Spaniards watched their silver flow through their hands and into the coffers of the other Christian nations of Europe.

In describing the impact of American silver on Europe, Voltaire wrote that the wealth "entered the pockets of the French, English, and Dutch who traded with Cadiz under Spanish names; and who sent to America the productions of their manufactories." He added that "a great part of this money goes to the East Indies to pay for spices, saltpeter, sugar, candy, tea, cloths, diamonds, and monkeys."¹⁰

Silver shipments from America arrived once a year, but the kings usually spent their portion before it arrived. To do this, they had to borrow money in advance of the ships' arrival and without knowing how much silver might be lost at sea or to pirates. At first the kings borrowed from their loyal subjects, but since they felt no obligation to pay it back, the already overtaxed subjects hid their money and quit lending it.

The kings then turned to foreign creditors. Although the Spanish monarchs ruled over one of the largest and richest empires in the world, they were constantly at the mercy of their bankers and creditors in Italy, Germany, and the Netherlands at rates of interest up to 18 percent per annum. In 1575, Philip II refused to pay his creditors, and they stopped funds flowing to his army in the Spanish Netherlands. The army revolted the following year and sacked the city of Antwerp to make up for their loss of salary. This disrupted trade and taxes, causing further harm to Philip and costing him considerably more than if he had continued to pay the Genoese bankers in the first place.

King Philip II borrowed money constantly to finance his adventures. He launched his expensive and disastrous Spanish Armada against England in 1588, and Spain pursued campaigns against the Protestants in the Netherlands in 1568 and 1618, fought revolts in Germany in the 1540s and 1550s, and launched wars against the Ottoman Turks in the 1530s and the 1570s.

By the 1640s, many of the Spanish provinces themselves had risen up in rebellion against the harsh taxation and repressive government of the Hapsburg monarchs. In some years, the Crown's expenditures

surpassed three times its income. Aristocrats and commoners also borrowed lesser amounts, making Spain one of the world's greatest debtor nations and eventually resulting in national bankruptcy. The first bankruptcy came in 1557 during the reign of Philip II; another followed in 1597, the year before Philip's death.

The noble families of Spain were steeped in too much aristocratic pride to bother themselves with mundane business and cheap commerce. They continued to picture themselves and their class as conquerors of the world, whose lives centered on swords, horses, tribute, and booty. They did not see themselves as mere merchants who transported cloth or grain by mule train and old barges to be sold to wholesalers on rat-infested wharves or to barter and truck with common people in the muddy markets of the city. They too borrowed heavily in order to keep up their lavish forms of conspicuous consumption. Large-scale public and private debt exacerbated the inflation.

Gold had much the same effect on Portugal that silver had on Spain. It created an appetite for new goods, but Portugal produced little other than wine, cork, and cattle. To meet their needs, the Portuguese turned to the English for manufactured goods. They formalized this relationship by treaty in 1703, and even more Portuguese gold and wine began to flow to England.

The trading partners of Portugal and Spain benefited from the influx of gold and silver from America, but they experienced much the same kind of inflation that had beset the Iberian countries. John Kenneth Galbraith noted that by the end of the seventeenth century, prices in England had risen to three times what they had been before the first trading voyages to America. During the same period, wages had only doubled.¹¹

The mining and trade of America's gold and silver continued very much under the control of the Spanish and Portuguese governments and that of their agents. In keeping with the economic thinking of the time, silver and gold were regarded as the keys to wealth; for most people, they were wealth itself. The man with the most silver or gold was the wealthiest, as was the country with the most gold and silver. The rich officials and court favorites of Spain and Portugal used their

wealth to buy what they wanted—soldiers and equipment to fight their wars and luxurious silks, porcelains, and spices for themselves and their palaces. They used the precious metals to decorate their homes and cathedrals and to adorn themselves, their furniture, and their coaches.

BAROQUE GOLD

Like many people when offered the opportunity, the Spaniards indulged themselves in the ostentatious display of gold. The Spanish baroque and rococo eras have probably never been matched for the lavish use of gold in decoration. They covered their walls with gilded molding of fruits, cherubs, urns, and flowing garlands. They applied gold to window frames, mirrors, and wall hangings. They used gold leaf on doors and balustrades. They covered their coaches with gold, and they applied it to the wooden frames of chairs, sofas, beds, chests, and cabinets. They dripped it on their hunting guns and knives. They put it on their belts and shoe buckles. They made dishes and snuffboxes from it. They covered their books with gold filigree and added golden hinges for their bindings. They embroidered golden threads into their clothing and the upholstery for their chairs as well as into their tablecloths, draperies, and tapestries. They lavished yet more gold and silver on the elaborate clothing of their footmen, coachmen, and dining room servants.

It is said that some of the altar objects in the cathedral of Toledo were made of gold that Columbus himself brought back from America and gave to Queen Isabella. In Rome, tradition maintains that the ceiling of the basilica of Santa Maria Maggiore was covered with the first of the American gold donated to Pope Alexander VI. The new wealth of the Americas revitalized the languishing Catholic church and financed its forays against the rising tide of northern Protestantism. As the Protestants denounced ostentation and turned toward starkly simpler forms of architecture and decoration, the newly enriched Catholic church encouraged an exaggerated level of decoration as a way to keep and inspire its followers.

In imitation of their monarchs and the pope, the wealthy aristocrats lavished even more gold and elaborate decoration on their

churches and cathedrals than on their palaces. They hid the ceilings and walls of old churches behind flocks of golden angels holding golden banners and attached to one another by long garlands of golden flowers, leaves, and baskets of golden fruit. From every corner and from behind every pediment peeked the cute faces of mischievous golden cherubs armed with golden bows and arrows.

The faithful parishioners covered the statues of their favorite saints with gold leaf and then clothed them in silk garments embroidered with gold and silver threads. To accentuate the glittering gold inside the churches, architects cut new windows out of the walls, opened skylights in the roof, and installed gilded mirrors in the niches. This allowed reflected light to strike the gold and make it sparkle and glitter dramatically in the newly brightened and sunny church interior. Artisans made the excess gold and silver into baubles for the table, decorations for the body, and objects for devotion. They did everything they could with it except eat or invest it.

This era, known as the *Siglo de Oro* (Century of Gold), marked the apogee of Spanish civilization. Its most treasured and abiding accomplishment, however, proved to be not its gilded architecture but its gilded literature. In literary terms, the Golden Age opened in 1522 when Garcilaso de la Vega began to write, and it closed in 1681 with the death of playwright Pedro Calderón de la Barca.

THE MONEY CULTURE

Even though Spain and Portugal encountered many difficulties managing the gold and silver that they extracted from the Americas after 1500, many other parts of the world profited handsomely. The spread of American gold and silver across the Atlantic and Pacific oceans opened the modern commercial era. During the sixteenth and seventeenth centuries, silver coins and even gold coins became more readily accessible than at any prior time in history. No longer would the use of precious metal coins be limited to wealthy individuals. Now the baker could use coins to buy flour from the miller, who used them to buy wheat from the farmer, who used coins to buy bread from the baker. The butcher, the weaver, the wheelwright, the seamstress, the dyer, the coachman, and the cooper began to buy their materi-

als and sell their products more often for money and less often in barter for other goods and services. Increasingly, taxes and tithes were paid in money rather than in produce.

Just as the banking revolution had increased the amount of money in circulation and brought merchants from all over western Europe into a single commercial and financial system, the increase of silver coins brought the lower classes into the system. The discovery of the great wealth of the Americas produced a far more immediate impact on the lives of common people than did the banking revolution. Professions that had traditionally depended upon money such as soldiers, artists, musicians, and tutors, now became even more focused on payment rather than on exchange of services such as room and board or rations paid in bread, alcohol, and salt. Even prostitutes and innkeepers became less willing to accept produce and goods in payment; they too wanted gold coins or at least silver ones.

Particularly in the seventeenth century, the new allocation of wealth gave rise to a middle class of merchants. They in turn spawned entirely new professions centered on money. As banking expanded, brokers appeared who specialized in the buying and selling of anything from real estate to shares in a trading voyage to China. Insurance men specialized in spreading out the risk of one voyage over many.

All of these new professions created new sources of wealth that, until now, had been small and unimportant, or entirely unknown, in aristocratic society. In feudal society, wealth had been derived from titles, privileges, and land bestowed by the monarch or taken by force during war. Now men without title, grant, or land had more money to spend than had the old aristocrats. In an era when warfare was increasingly the responsibility of a professional army rather than of the aristocratic class, the rising merchants found themselves able to buy large amounts of land that did not need to be seized in warfare. In the new social system, title and privilege increasingly followed the accumulation of family money and the careful arrangement of profitable marriages.

The greater supply of coins also facilitated international commerce and financial ties that gradually began to knit together the re-

gional economies of the world. Merchants outside Europe would not accept the bankers' bills of exchange, but they eagerly accepted the new silver coins minted in Peru and Mexico. The greatest initial impact occurred in Africa, where the new wealth stimulated the traditional slave market to grow larger than ever. Very quickly after the tapping of American wealth, Africa became a part of the triangular trade with Europe and America. African slaves went to Caribbean plantations. American silver and Caribbean sugar went to Europe. Much of the silver and European manufactured goods then went to Africa to buy more slaves to ship to America.

During the eighteenth century, the commercial ties stretched from the northern and mid-Atlantic to include the Pacific and Indian oceans and, eventually, even the Arctic. The network expanded from the slave trade to include the spice trade with south Asia, the silk and porcelain trade with China, the opium trade with India, and the fur trade with Siberia, Canada, and Alaska.

In conquering America, Spain opened a pipeline that pumped a torrent of silver into the world's economy, but Spain was helpless to control that flow. Neither Chinese emperor nor Ottoman sultan, neither Persian shah nor Russian czar proved any more adept at channeling and controlling it than the Spanish kings. Spain had unleashed a power that raced around the globe and operated with a force of its own, independent of both church and state. The wealth of America had run amok, and the world would never again be the same.

Phase II

PAPER MONEY

Geld regiert die Welt
(Gold rules the world.)

—GERMAN PROVERB

7 *The Birth of the Dollar*

Money, not morality, is the principle of commercial nations.

—THOMAS JEFFERSON

ONLY THE MUSE OF HISTORY, TOTALLY UNAPPRECIATIVE of coincidence, irony, and symbolism, could have written a scenario in which both the dollar and the atomic bomb originated in the same little European hamlet. The history of the Czech village of Jáchymov reads like a cheap Hollywood script that no reader would find credible and no producer would be willing to film; yet it was from this tiny town that the dollar developed and grew to become the preferred currency of the world.

The movie opens when Count Stephan Schlick, a Bohemian nobleman, discovers a rich vein of silver near his ancestral home, the Castle of Joy, and from that silver he secretly mints his own coins, which become the world's first dollars. The action then fast-forwards to the end of the nineteenth century when a young girl named Marie, eager to overcome the double handicap of being both female and Polish, uses uranium from the same mines to discover radium and rise to the top of the science world. After winning a Nobel Prize with the man she loves, he is killed in a traffic accident, and Marie Curie, in her sorrow, devotes the rest of her life to working in the laboratory on radium, which she is convinced is a miracle medicine but which is slowly poisoning her to death.

Almost as soon as our heroine dies, German troopers storm into the Czech village, bringing with them inmates from nearby concentration camps to mine the uranium for the atomic bomb their scientists are striving to perfect. Before the Germans can complete their

bombs, however, the Russians arrive, fill the camps with their own prisoners, and successfully use the uranium to make their first atomic bomb.

Jáchymov, a Bohemian village of 2,700 inhabitants, perches at the head of a steep valley in the Krušnéhory, the Ore Mountains in the western part of what is now the Czech Republic. Its broad main street ascends the mountain at a sharp angle, creating an ideal passageway for that peculiarly fresh, cool, and moist air that seems to be found only in mountains. A conglomeration of buildings spanning the last five centuries lines the street, but the old yellow and white paint and stucco have been chipped and broken from their facades. Shutters have rotted away, and tiles have fallen off the houses only to be replaced by tin roofs painted in bright shades of red, blue, green, and gray. No matter how shabby the old buildings may be, they still look better than the six-story apartment buildings of corroded cement and rusted metal erected on the edge of town during the Communist regime. The ugliness of the buildings is relieved only by the deep green of the trees and the carefully cultivated lilac bushes that bloom along the main street in June.

Because the village lies only a few kilometers from the German state of Saxony, many of the signs along the main street are written in German and advertise ice cream, champagne, and other goods that sell for less on the Czech side of the border. An occasional car can be found beside the road covered with deer antlers, animal skins, or other hunting trophies that the owner is trying to sell to visiting Germans. On summer weekends, the Natashas, Russian girls in short skirts and skimpy blouses, hang out along the street selling their services to foreign truck drivers en route to Prague.

At the entrance to the town, some of the shops have a platoon of garden gnomes standing in front of them. The Vietnamese women who run the shops stand in the doorway and wave cartons of cigarettes at passing motorists, most of whom are Germans in search of cheap meals, cheap sex, or cheap merchandise. The Vietnamese women came to Czechoslovakia in an era of friendship between the two Communist nations. Too poor to pay for the manufactured goods that it received from Czechoslovakia, Vietnam paid in the only cur-

rency it had—its own people, whom the Vietnamese government shipped to Czechoslovakia and the other socialist states as workers. After the fall of the Communist Party in Czechoslovakia and the division of the country into the Czech and the Slovak republics, the Vietnamese found themselves suddenly free and far from home. They then sought out small niches in the newly emerging economy where they could thrive but not succeed so much that they would pose a threat and therefore be deported. Many of them ended up in places like Jáchymov selling garden gnomes and cheap cigarettes.

In the center of the village looms the Renaissance-style city hall, which was built as the home of Count Hieronymus Schlick between 1540 and 1544. Behind it sits the squat half-timbered building constructed by order of King Ferdinand I between 1534 and 1536 to be the imperial mint. It was made into a museum in 1976, but closed after only a decade due to structural damage and deterioration. The building has a bay window on the corner and a coat of arms depicting two crossed miner's hammers topped by a crown. It bears the date 1536.

At the opening of the sixteenth century, Jáchymov came under German administration when Bohemia became part of the Holy Roman Empire. Count Schlick and his family ruled the remote and largely unsettled area from Hrad Freudenstein. It would have been quite an unlikely location in which to imagine a future event that would have a radical impact on the monetary history of the world. Miners discovered silver deposits in approximately 1516, but silver mining was not new to Bohemia. Farther east, in the center of the country, major silver mines had been in operation in Kutná Hora for centuries.

Rather than merely mining the silver and selling it to others, Count Schlick surreptitiously began minting silver coins called *groschen*. According to local tradition, he made the very first coins in 1519 in his castle, even though he did not receive official permission for such minting until January 9, 1520.

From the German name of the valley, Joachimsthal, the coins were called *Joachimsthalergulden*, or *Joachimsthalergroschen*, names that were far too long for daily use even by German speakers. The coins

became more widely known as talergroschen and eventually as talers, or thalers. Because of the ample supply of silver in the mines of western Bohemia, the heavy and substantial talers steadily increased in number, and because of the economic and political connections throughout the Holy Roman Empire, the talers spread to all parts of it, including Spain.

Saxon mineralogist and general scholar Georg Bauer, whose Latin name was Georgius Agricola, began a systematic study of the minerals in the Jáchymov area and the ways in which they were mined. He published in 1530 a book on the mines, and he wrote some of the first scientific treatises on mines and minerals. He later became known as the Father of Mineralogy.

With the opening of Jáchymov to mining, the community quickly grew to 18,000 inhabitants, who stripped the surrounding mountains of trees, which were used as timbers in the mines and to make charcoal with which to smelt the silver ore. Mining nearly ended when a plague erupted in 1568 and killed nearly one thousand community residents. By the next century, the miners had become strict adherents of the new Protestantism sweeping the German states, including neighboring Saxony, but the Bohemian monarchy began a fierce campaign of forced conversion to Catholicism. Many villagers fled or were killed until the population had dropped to only 529 inhabitants by 1613. In 1627, the government closed the Protestant church for one year and then reopened it as a Catholic one; they also shut down the village school, calling it a nest of Protestantism. The village and its mines never recovered, and the government finally moved the official mint to Prague in 1651.

In the century between 1519 and 1617, however, when talers were minted in Jáchymov, production began with about 250,000 talers in the first year. At maximum production, from 1529 to 1545, the mines supplied enough silver to mint 5 million talers. It is estimated that by the end of the century, Jáchymov had put nearly 12 million talers into circulation in addition to the many smaller coins produced by its mint.

THE SPREAD OF THE DOLLAR

The coins of Jáchymov spread around the world, influencing the names of many different European coins. Initially, for example, the taler was a large silver coin worth three German marks, but it eventually gave its name to any large silver coin. The word passed into Italian as *tallero*, into Dutch as *daalder*, into Danish and Swedish as *daler*, into Hawaiian as *dala*, into Samoan as *tala*, into Ethiopian as *talari*, and into English as *dollar*. It also became part of the name of the Swedish *riksdaler* and the Danish *rigsdaler*.

"Taler" became a common name for currency because so many German states and municipalities picked it up. During the sixteenth century, approximately 1,500 different types of talers were issued in the German-speaking countries, and numismatic scholars have estimated that between the minting of the first talers in Jáchymov and the year 1900, about 10,000 different talers were issued for daily use and to commemorate special occasions.

The most famous and widely circulated of all talers became known as the Maria Theresa taler, struck in honor of the Austrian empress at the Günzburg Mint in 1773. In a century of powerful women, she stands out; she reigned as empress, and her father, husband, and son were all emperors. Born in 1717, the daughter of Emperor Charles VI, Maria Theresa became archduchess of Austria and queen of Hungary and Bohemia. She married the duke of Lorraine, who became Holy Roman Emperor Francis I. She participated in seemingly every war, treaty, and other major event in Europe during her lifetime, from the War of Austrian Succession (1740–1748) to the partition of Poland (1772).

The coin bearing the portrait of Maria Theresa became so popular, particularly in North Africa and the Middle East that, even after she died, the government continued to mint it with the date 1780, the year of her death. The coin not only survived its namesake but outlived the empire that had created it. In 1805, when Napoleon abolished the Holy Roman Empire, the mint at Günzburg closed, but the mint in Vienna continued to produce the coins exactly as they had been with the same date, 1780, and even with the mintmark of the closed mint. The Austro-Hungarian government continued to

mint the taler throughout the nineteenth century until that empire collapsed at the end of the World War I. The new Austrian Republic continued to make the Maria Theresa taler until Hitler seized the country in 1937.

When Mussolini conquered Abyssinia (Ethiopia), he found that the economy depended heavily upon the Maria Theresa taler. In fact, the natives proved so unwilling to accept any substitute for it that Rome had to mint its own talers between 1935 and 1937. Later, Brussels, Prague, Leningrad, London, Rome, and Bombay started making them, and after the Second World War, the new Republic of Austria resumed minting the coins from 1956 until 1975. Numismatic historians estimate that a total of 800 million silver Maria Theresa talers were struck between 1780 and 1975, all bearing the date 1780.

Other countries began copying the design of the Maria Theresa taler shortly after it went into circulation. They minted coins of a similar size and put on them the bust of a middle-aged woman who resembled Maria Theresa. If they did not have a queen of their own who fit the description, they used an allegorical female such as the bust of Liberty that appeared on many U.S. coins of the nineteenth century.

The name *dollar* penetrated the English language via Scotland. Between 1567 and 1571, King James VI issued a thirty-shilling piece that the Scots called the sword dollar because of the design on the back of it. A two-merk coin followed in 1578 and was called the thistle dollar. The Scots used the name *dollar* to distinguish their currency, and thereby their country and themselves, more clearly from their domineering English neighbors to the south. Thus, from very early usage, the word *dollar* carried with it a certain anti-English or antiauthoritarian bias that many Scottish settlers took with them to their new homes in the Americas and other British colonies. The emigration of Scots accounts for much of the subsequent popularity of the word *dollar* in British colonies around the world.

Despite the widespread use of the dollar, or taler, from the sixteenth century onward, no major country adopted it as its official currency until the formation of the United States. It might seem that, as the

offspring of Britain, the thirteen American colonies would be accustomed to using the British currency of pounds, crowns, shillings, and pence, but the British colonies in North America suffered from a constant shortage of all coins. The mercantile policies then in vogue in London sought to increase the amount of gold and silver money in Britain and to do whatever was practical in order to prohibit its export, even to its own colonies. Beginning in 1695, Britain forbade the exportation of specie to anywhere in the world, including to its own colonies. As a result, the American colonies were forced to use foreign silver coins rather than British pounds, shillings, and pence, and they found the greatest supply of coins in the neighboring Spanish colony of Mexico, which operated one of the world's largest mints.

The Spanish coin bore a face value of eight reales in the Spanish system, *real* being the Spanish word for "royal." Eight of these royals equaled a peso, a coin originally established by Queen Isabella and King Ferdinand in their currency reform for the united Spain in 1497. The Americans rejected both *real* and *peso* as a name for the money, but the number eight stuck to the coin so that it was often referred to as eight bits or pieces of eight. Today the phrase "two bits" still refers to a quarter.

Because of the great wealth produced in Mexico and Peru, Spanish coins became the most commonly accepted currency in the world. The Spanish word *real* also gave rise to *rial*, which is used in Oman and Yemen while an alternate spelling, *riyal*, is used in Saudi Arabia and Qatar. The English-speaking peoples, however, preferred the already familiar word *dollar*.

The most common Spanish coin in use in the British colonies in 1776 was the pillar dollar, so named because the obverse side showed the Eastern and Western hemispheres with a large column on either side. In Spanish imperial iconography, the columns represented the Pillars of Hercules, or the narrow strait separating Spain from Morocco and connecting the Mediterranean with the Atlantic. A banner hanging from the column bore the words *plus ultra*, meaning "more beyond." The Spanish authorities began issuing this coin almost as soon as they opened the mint in Mexico with the intent of

publicizing the discovery of America, which was the *plus ultra*, the land out beyond the Pillars of Hercules.

Some people say that the modern dollar sign is derived from this pillar dollar. According to this explanation, the two parallel lines represent the columns and the S stands for the shape of the banner hanging from them. Whether the sign was inspired by this coin or not, the pillar dollar can certainly be called the first American silver dollar.

In 1782, Thomas Jefferson wrote in his *Notes on a Money Unit for U.S.* that "The unit or dollar is a known coin and the most familiar of all to the mind of the people. It is already adopted from south to north."

The American colonists became so accustomed to using the dollar as their primary monetary unit that, after independence, they adopted it as their official currency. On July 6, 1785, the Congress declared that "the money unit of the United States of America be one dollar." Not until April 2, 1792, however, did Congress pass a law to create an American mint, and only in 1794 did the United States begin minting its first silver dollars. The mint building, which was started soon after passage of the law and well before the Capitol or White House, became the first public building constructed by the new government of the United States.

In using the word *dollar*, the Congress may have yielded to popular usage, but neither Thomas Jefferson nor Alexander Hamilton showed much fondness for the term. Yet they never suggested an alternative. They wrote the laws to refer to the currency as the dollar, or unit, apparently with the idea that they would think of a better name later. *Unit* was never much used outside of the law, and the people continued with *dollar*.¹ In accepting the dollar as the national currency of the United States, the Congress made official what had already become common practice in most parts of the colonies. With virtually no access to gold or silver, the U.S. government lacked the ability to mint coins other than by melting the silver coins of other nations and reminting them as American; rather than go to such effort, U.S. authorities allowed the Spanish dollar to continue as the de facto currency of the new nation. After Mexico gained its inde-

pendence from Spain in 1821, the new Mexican government issued its own pesos with a slightly higher silver content than the old Spanish reales. The new Mexican peso—or Mexican dollar, as it was usually called—immediately became legal tender in the United States and remained so throughout most of the nineteenth century.

In order to determine the initial value of the U.S. dollar, the newly formed American government set up a study to weigh the Spanish dollars circulating in the United States, and found that they averaged 371¼ grains of silver, rather than the 377 grains claimed by Spain. In accordance with this finding, the U.S. Congress set the value of the American silver dollar at the rather odd standard of 371¼ grains, and it remained at that assigned weight for as long as the United States minted silver dollars.

In 1787 the United States issued its first coins. The copper coins worth one cent bore the motto "Mind your business." The sun appeared above a sundial with the inscription "Fugio," meaning "I fly." Because of this inscription, the coins became known as fugio cents.

The other side of the coin bore the image of a chain of thirteen linked circles, each inscribed with the name of one of the thirteen newly united states. The chain encircled the inscription "We Are One," and for the first time in coin history, it bore the name "United States." The image of the chain came from the Iroquois, who depicted the unity of their five tribes in a wampum belt composed of interlocking links and known as "the great chain of friendship."

By using emblems such as the chain in addition to the eagle, stars, or the bust of Liberty, the colonists had made an important decision to distinguish their American dollar from European coins. Because European coins bore the likeness of a monarch—George III on British coins, for instance, and Carlos III on Spanish ones—some Americans thought that U.S. coins should bear the likeness of President George Washington. The majority, however, rejected that idea. Most newly independent Americans felt that the use of a president's image, even that of George Washington, smacked too much of elitism and royalty. They claimed that the money of a free, democratic people

should bear inscriptions and allegorical figures, not portraits of politicians. This steadfast refusal to put the picture of a person on the coin persisted in the United States for almost a century.

THE PACIFIC DOLLAR

The use of Spanish, Mexican, and American dollars spread north into Canada where they became the de facto currency of the land. In 1858, authorities in the Dominion of Canada, which then included only Ontario and Quebec, acceded to popular usage and created the Canadian dollar as its official currency. They pegged the value of the Canadian dollar at a one-to-one equivalent with the U.S. dollar. The provincial government issued small denominations in copper but relied on American and Mexican silver dollar coins even after the formation of the Dominion of Canada. Canada did not issue its own silver dollars until 1935.

Throughout the Caribbean, the Mexican dollar played a primary role just as it did in the United States. Virtually all of the former British colonies in this area adopted it as their currency. The dollar also became the name of the currency of Anguilla, Saint Kitts and Nevis, Antigua and Barbuda, Montserrat, Dominica, Saint Lucia, Saint Vincent, Guyana, the Bahamas, Belize, Barbados, the Cayman Islands, the British Virgin Islands, Trinidad and Tobago, the Turks and Caicos Islands, and Jamaica.

Even though the word *dollar* originated in Europe and spread to every continent, it has rarely been used as an official name for a European currency, that is until 1991, when Slovenia gained its independence from the old Yugoslavian Federation and chose *tolar*, a variation of *dollar*, for its new national currency. The new name clearly set Slovenia monetarily apart from its Yugoslavian, Turkish, Italian, and Austrian neighbors and former rulers.

The Spanish and Mexican dollars became so closely associated with commerce in the Pacific Basin that in the nineteenth century, other countries also began to mint their own coins, which were known as "trade dollars." By a congressional act of February 12, 1873, the United States issued special trade dollars for American commerce with China, but they served more generally for trade with any Asian nation. Britain began issuing such trade dollars in 1895 and

marked them in English, Chinese, and Malay-Arabic script.

The Chinese called these many different silver dollars *yuan*, meaning "round things," and that became the name of the standard currency in China and modern Taiwan. The association between *yuan* and *dollar* in Taiwan has been so close that the two words are used interchangeably. The Japanese adopted the Chinese name but reduced it in from *yuan* to *yen* in 1871. The Japanese issued gold and silver coins, and, staying true to its original meaning of dollar in the late nineteenth century, the yen and the U.S. dollar shared an approximately equal value.

The use of trade dollars in the Pacific Basin solidified the use of the word *dollar* throughout the area. The Kingdom of Hawaii and the later republic used the dollar as its primary currency in a system based on that of the United States. Their silver dollars bore the bust of the monarch on the front and the national coat of arms on the back.

In the Pacific area of today, the U.S. territories and affiliated commonwealths of Guam and the Federated States of Micronesia continue to use the U.S. dollar as their currency. In addition, the name *dollar* was adopted for the currency of the Pacific nations of Australia, New Zealand, Fiji, the Cook Islands, Kiribati, Brunei, Singapore, Hong Kong, the Solomon Islands, Pitcairn, Tokelau, Tuvalu, the Marshall Islands, and Western Samoa. By contrast, the franc became the second most common denomination in the South Pacific, but it was used only in the French colonies such as New Caledonia, French Polynesia, and the Wallis and Futuna Islands. In the eastern Pacific, most of the Latin American countries from Chile to Mexico use the peso, which descends directly from the same Spanish reales as did the dollar, making both the dollar and the peso offspring of the same mother despite their different names.

As of 1994, some thirty-seven countries and autonomous territories around the world had adopted the name *dollar* for their national currency. Although countries such as Belize pegged the value of their own dollar to that of the U.S. dollar, and other countries such as the Cook Islands pegged their dollar to the New Zealand dollar, most countries operated independently of one another with their own values set in the world currency exchanges.

THE LAST SILVER DOLLAR

After reaching its maximum usage around the beginning of the twentieth century, the American silver dollar coin began to die. In 1935, during the Great Depression, the U.S. Treasury ended the minting of silver dollars; then, with the passage of the Coinage Act of 1965, they ceased using silver in American coins, replacing it with copper covered in cupronickel.

In Africa, only Liberia, one of the oldest independent countries on the continent, and Zimbabwe, one of the most recently independent countries, have named their national currencies *dollars*. In Liberia, founded in 1822 by emancipated American slaves, the first currency consisted of American coins that the settlers brought with them to their new homeland. Although supplemented by various tokens and by the coins of other African colonial powers such as Britain, the use of the dollar continued in Liberia until 1943 when the government banned the use of all foreign currency except the U.S. dollar. Beginning in 1960, Liberia had its own silver dollars minted at the Royal Mint in London, but it continued to use American paper dollars for all denominations higher than one dollar. Liberia became one of the last countries to mint and use silver dollars, thereby bringing to a close a long chapter that had begun over four centuries earlier in the distant mines of Jáchymov.

Beginning in 1987, the government of Liberia began withdrawing the silver dollars from circulation and issuing in their place a cupronickel dollar that looked like the old silver dollar and bore the date 1968 but contained no silver. They continued minting and using these fake silver dollars stamped with the year 1968 until the 1990s. To profit more from foreign sales, the corrupt Liberian government issued its own Kennedy dollar in 1989, but they misspelled *memoriam* as *memorium*, thereby increasing the novelty value of the coin among collectors but doing little for the respectability of the Liberian currency.

8

The Devil's Mint

The trouble with paper money is that it rewards the minority that can manipulate money and makes fools of the generation that has worked and saved.

—ADAM SMITH [GEORGE GOODMAN]

AT ONE END OF FOURTEENTH STREET IN WASHINGTON, D.C., prostitutes and drug dealers brazenly ply their trade night and day. At the other end, near the White House and the bridge into Virginia, the federal government prints money night and day in the workrooms of the Bureau of Engraving and Printing, a part of the Treasury Department that advertises itself to tourists as “the money factory.”

On weekday mornings tourists begin lining up well before the opening hour of 9:00 A.M. to see how America prints its paper money. The visitors enter the building through a sequence of security checks leading into a dilapidated wooden corridor. Large color portraits of the president, vice president, and secretary of the treasury beam down from the walls. Visitors pass a sequence of photographs and paintings detailing the history of paper money in the United States and culminating with a life-size re-creation of President Lincoln signing the legislation authorizing the federal government to print money.

At the end of the long corridor, visitors watch a short video on the history of paper money, after which guides divide them into small groups before they enter the work area. These small groups wend their way through the carefully marked visitors' corridors past glass-enclosed galleries from which they can watch the sheets of dollars

being printed, examined, cut, and stacked as the guides dispense a constant flow of facts about America's money:

- The dollar is printed on textile paper made by the Crane Company using a mixture of 75 percent cotton and 25 percent linen with a polyester security thread.
- The printing machines are made by Germans and Italians.
- Nearly half of the bills printed in a day are one-dollar notes, and 95 percent of the bills are used to replace worn-out bills.
- The average life span of a bill varies from eighteen months for the one-dollar note to an ancient nine years for a one-hundred-dollar note. A bill can be folded four thousand times before it tears.
- Approximately three thousand people work for the Bureau of Engraving.
- It takes 490 notes to make a pound, and it would require 14.5 million notes to make a stack one mile high.
- Coin and paper account for only about 8 percent of all the dollars in the world. The rest are merely numbers in a ledger or tiny electronic blips on a computer chip.

At the end of the process, the workers bundle the bills into packages of 100, which they then stack into bricks of 4,000. These bricks are loaded onto a pallet for transport to the basement from where they will be sent to the various Federal Reserve offices around the nation for distribution to banks and the public. Along the way, the curious visitors pepper the guides with questions:

- Q. Why are so many employees listening to music on headphones?
 A. To block the loud sound of the printing, cutting, and stacking machines.
- Q. Why are some of them eating?
 A. They are on break.
- Q. Why are all of the checkers so fat?
 A. Because they sit all day and watch money go by with little chance for exercise.

Following the tour, the guides usher the visitors into a cavernous hall where interactive displays invite them to press buttons to learn about the different parts of the dollar or to hear about its history. Children press the buttons, but the lights do not go on, and so none of the questions are answered. They rush to the next interactive display only to find that it too no longer interacts. The large room also offers souvenirs for sale, such as a souvenir pen filled with shredded money. In a corner, Japanese tourists buy sheets of uncut American currency from women behind security windows of thick glass. They take the money home with them to use as novelty wrapping paper for gifts and flowers.

The twentieth century became the era of paper money. Never before had so much of it been manufactured in so many countries and in so many denominations. Behind the perpetually operating machines of the U.S. Treasury lay a long process whereby paper money won the confidence of ordinary people.

MULBERRY MONEY

The Chinese economy has always operated by its own monetary rules, which were usually created and enforced by a powerful state with a large bureaucracy and a strong army. Whether China was under the rule of a dictatorial emperor, rival warlords, or the Communist Party, its commerce has almost always been controlled by state forces rather than market forces. In such a system, gold and silver coins rarely had any role. For much of Chinese history, the emperor's government issued simple tokens, usually known as cash and made of brass or copper. These tokens had a square hole in the middle so that they could be strung together in sums of up to one hundred.

Since the cash itself was bulky and merely a token anyway, it was a small step to simply drawing a picture of the cash on a piece of paper. The drawing could then stand for one thousand or even ten thousand coins. The invention and dissemination of paper money in China marked a major step forward in government control of the money supply, a development that could have occurred only in a great empire with a ruler powerful enough to impose the will of the state

on the economy—even to the point of executing those citizens who dared to oppose its monetary policy.

The invention of paper money, of course, had to await the invention of paper and printing. Unlike metal technology, which came early in human history, the discovery of paper and the dissemination of paper-making technology came relatively late and spread slowly. The ancient people of the Mediterranean used parchment made from sheepskin for recording information. For a while during the Hellenistic era and the time of the Roman Empire, papyrus was exported from Egypt for use as a simple writing material, but it was not durable enough to be used as paper money.

It is no accident that printing, papermaking, and paper money all originated in China. In the first or second century A.D., Ts'ai Lun supposedly made the first paper from the bark of the mulberry tree, whose leaves fed the caterpillars of the lucrative Chinese silk industry, but actually papermaking may be centuries older than that. The technology for making paper seems to have been confined to China for at least a millennium. The use of paper money in China was mentioned as early as the T'ang dynasty and some illustrations of it have survived, but no examples from that era have been found.

Of all the strange customs Marco Polo encountered during his travels to Asia in the thirteenth century, none seemed to astound him more than the power of the state to produce paper money and to compel its use throughout the empire. Chinese bureaucrats made paper bills from the mulberry bark paper. Once stamped with the vermilion seal of the emperor, these bills carried the full value of gold or silver. Chinese notes were as large as napkins. A note representing one thousand coins measured nine by thirteen inches. Despite its awkward size, the bill weighed very little and thus represented a great improvement over the coins, a thousand of which weighed about eight pounds.

The use of paper money in China reached its peak under the rule of the Mongol emperors. They needed to administer the largest empire in world history, and like any ruler of a great bureaucracy, they found paper an invaluable asset. The paper bills made collecting taxes and administering the empire much easier while greatly re-

ducing the need to transport large quantities of heavy coins.

In 1273, Kublai Khan issued a new series of state-sponsored and -controlled bills. To enforce their use he utilized essentially the same methods that any government must use to back up its currency: he gave payment only in the form of paper money and compelled everyone to accept it in payment under penalty of great punishment. To ensure its use in circles wider than merely the government, the Chinese government confiscated all gold and silver from private citizens and issued them paper money in its place. Even merchants arriving from abroad had to surrender their gold, silver, gems, and pearls to the government at prices set by a council of merchant bureaucrats. The traders then received government-issued notes in exchange. Marco Polo saw clearly that this system of paper money could work only where a strong central government could enforce its will on everyone within its territory.

Much the same observation of governmental power over paper money was made by the Moroccan traveler Muhammad ibn-Batuta, who visited China in 1345. He reported that it was impossible to pay with gold or silver coins in Chinese markets. Such coins had to be converted to strips of paper about the size of the palm of the hand and bearing the seal of the sultan. He also reported that every foreign merchant was required to deposit all of his money with an official who then paid all of his expenses, including the cost of a concubine or slave girl, if the merchant so desired. At the end of the merchant's stay, the official returned what money he was due as he departed from China.

Ibn-Batuta described China as the safest country in the world for merchants. No matter how far they traveled or how much paper money or other goods they carried with them, they were almost never robbed. To create this level of safety the government operated a police state in a surprisingly modern sense. Bureaucrats sketched detailed portraits of all entering foreigners so that their pictures could be quickly circulated if they committed a crime. At each stop, the merchant had to register with the police, and his name was forwarded to authorities at the next stop before he could leave. At each stop an army official inspected foreign merchants each morning and

night and locked them up in a hostelry for the night.

Ibn-Batuta, however, observed a possibly unintended consequence of the outlawed use of coins: since merchants were forbidden to own silver or gold coins, they melted the contraband coins into ingots, which they stored in the rafters above their doorway. Ibn-Batuta may have been witness to a form of resistance that had escaped Marco Polo's notice; or, more likely, the power of the emperor and the central state was in decline during the fourteenth century, more than half a century after Marco Polo's visits to the court of the powerful new Mongol rulers.

Today no known copies of the Mongol money survive, but museums exhibit the few remaining Kwan notes issued by the Mongols' successors, the Ming emperors, between 1368 and 1399. The Chinese then abandoned their paper money system, and it did not reappear until the dawn of the twentieth century and the economic colonization of China by the various European empires.

By using paper money and brass or copper tokens instead of gold or silver coins, the Chinese authorities never had to worry about the purity of their coins. Herein, however, lay a crucial distinction between the money system of China and that which developed in the Mediterranean. The purpose of paper money in China was to allow the government a monopoly over silver and gold. Paper flowed from the capital to the provinces while gold and silver flowed from the provinces to the capital.¹ Paper functioned as part of the tribute system and stifled the development of healthy commerce. By contrast, the paper systems that developed in the West, at least initially, were designed to increase the flow of goods. Only later did they fall into the Chinese trap of becoming a way for government to confiscate gold and silver.

In the West, paper found its most important use as a means of keeping ledgers in banks. Long before it was used as a means of printing more money, it was used by bankers to increase the money supply. Only later did it gradually emerge as a replacement for coins in daily commerce. The initial development and circulation of monetary bills made of paper came about as a side effect of banking.

Paper money helped to solve a major problem in handling gold.

Because even minute amounts of gold had great value, people had always found ways to adulterate gold coins. One of the simplest was to "sweat" the coins by vigorously shaking them in a pouch so that they hit and scraped against one another, a process that invariably left a little gold dust behind. One of the earliest solutions to this problem by merchants in the Mediterranean was to seal gold coins in a small purse with the exact value and type of coin written on the outside. Thus merchants became accustomed to accepting in payment a coin that they could never touch or see. The merchants had to have faith in the stamp of the person who first sealed the coin—usually another merchant, a government official, or a banker. It was only one more step from this process to keep the gold coins in a safe place and circulate only the label.

THE DUKE OF ARKANSAS

Despite the importance of paper money in Chinese history, the modern world system of paper money did not develop in China, or even in the Mediterranean homeland of Marco Polo or Ibn-Batuta. It evolved in the trading nations around the North Atlantic. Repeatedly in European records we find mention of money made from leather during times of warfare and siege. Reports indicate that European monarchs occasionally used paper money during periods of crisis, usually war, and they do maintain that in Catalonia and Aragon, James I issued paper money in 1250, but no known examples have survived. Then, when the Spanish laid siege to the city of Leyden in the Lowlands in 1574, Burgomeister Pieter Andriaanzoon collected all metal, including coins, for use in the manufacture of arms. To replace the coins, he issued small scraps of paper.

During the time of Gutenberg, the technology for both printing and superior papermaking spread through Europe. Some scholars maintain that the boom in paper production came as an indirect result of the bubonic plague, which killed a third of the European population. The old clothing left behind by the millions of plague victims became a cheap raw material for papermakers and thus encouraged new uses for the paper. Regardless of the importance of the plague in stimulating the paper business, the invention of movable

type for printing certainly created a new and greatly expanded market for printed materials and made possible the expanded use of paper money.

In July 1661, Sweden's Stockholm Bank issued the first bank note in Europe to compensate for a shortage of silver coins. Although Sweden lacked silver, it possessed bountiful copper resources, and the government of Queen Christina (1634–1654) issued large copper sheets called *platmynt* (plate money), which weighed approximately 4 pounds each. In 1644 the government offered the largest coins ever issued: ten-daler copper plates, each of which weighed 43 pounds, 7¼ ounces. To avoid having to carry such heavy coins, merchants willingly accepted the paper bills in denominations of one hundred dalers. One such bill could be substituted for 500 pounds of copper plates.

It was unclear at first whether paper money should be created by the government or by private institutions such as banks. Generally, local banks lacked the ability to create a truly national currency. The first national experiment for such paper money was undertaken in France.

By royal decree on May 5, 1716, the French chose a Scotsman, John Law, to head up a bank named Law and Company, but quickly renamed Banque Générale. John Law—a handsome, wealthy, and popular ladies' man—had written several pamphlets on trade, money, and banking, including *Money and Trade Considered with a Proposal for Supplying the Nation with Money*, published in Edinburgh in 1705, in which he proposed that paper money could create wealth. Law was a self-taught banker who was also a heavy gambler and a convicted murderer in England. He allegedly claimed that he had found the true philosopher's stone to make gold from paper by printing money.²

The creation of the bank proceeded in clear imitation of the already successful Bank of England. Under special license from the French monarch, it was to be a private bank that would help raise and manage money for the public debt. In keeping with his theories on the benefits of paper money, Law immediately began issuing paper notes representing the supposedly guaranteed holdings of the bank in gold coins.

Initially, the bank operated quite successfully, but it remained in-

dependent for a mere two years before the duc d'Orléans, who ruled as regent for the Louis XV, a minor, took control of the bank by decree on December 14, 1718, and changed it to the Banque Royale, the official bank of the French government. The bank continued under the administration of John Law, who had by now become the duc d'Arkansas and who issued ever more paper with the confidence of the government behind him.

Law was also instrumental in establishing the Compagnie d'Occident of 1717, generally known as the Mississippi Company and formed to bring home the great wealth of France's holdings in Louisiana. Investors received their profits from subsequent investors in a giant pyramid scheme. To maintain the illusion of great profits lying just over the horizon, the company directors hired unemployed men to dress as miners and march through the streets of Paris with shovels and axes on their shoulders as though they were off to rake in great wealth from Louisiana. The Banque Royale printed paper money, which investors could borrow in order to buy stock in the Mississippi Company; the company then used the new notes to pay out its bogus profits. Together the Mississippi Company and the Banque Royale were producing paper profits on each other's accounts. The bank had soon issued twice as much paper money as there was specie in the whole country; obviously it could no longer guarantee that each paper note would be redeemed in gold. The Mississippi Company collapsed when it became obvious that the wealth would never materialize, and the bank fell with it. By the end of 1720, the Banque Royale lay devastated with a trail of worthless paper notes behind it.

In "The Great Mississippi Bubble," American writer Washington Irving vividly described the scene in Paris: "The doors of the bank and the neighboring street were immediately thronged with a famishing multitude, seeking cash for bank-notes of ten livres. So great was the press and struggle, that several persons were stifled and crushed to death. The mob carried three of the bodies to the courtyard of the Palais Royal. Some cried for the Regent to come forth and behold the effect of his system; others demanded the death of Law, the impostor, who had brought this misery and ruin upon the nation."³

The disgraced and hated John Law, the mastermind behind the

whole paper affair, fled to England and then to Venice, where he died in 1729. His title, the duc d'Arkansas, died with him.

Half a century later, during the French Revolution, the new Republican leaders sought to finance the government and their revolution with a new form of paper money, the *assignat*. In all, the various governments of the French Revolution issued some 40 billion assignats before 1796. The government finally bowed to public anger at the paper assignat in a great public spectacle at the Place Vendôme on February 18, 1796. Before a great crowd, government officials solemnly destroyed all the machines, plates, and paper used in printing the assignat in an effort to show that the assignat itself, rather than the government's manipulation of paper money, bore the guilt for the monetary collapse. The government began the unfortunate cycle anew by issuing yet more paper money but calling it by yet another name: the *mandat*.

THE FATHER OF PAPER MONEY

The idea and the technology for paper money had become firmly established in Europe, but its first successful application occurred across the ocean. Neither China nor Europe became the cradle of paper money; rather, it was to be North America, the continent that was perpetually short of coins. John Kenneth Galbraith observed that "if the history of commercial banking belongs to the Italians and of central banking to the British, that of paper money issued by a government belongs indubitably to the Americans."⁴

As early as 1690, the Massachusetts Bay Colony printed the first paper money in North America. Colonists later printed various types of money geared for local use over short periods of time, but one man was largely responsible for creating paper money in much greater amounts for use in three of the colonies on a nearly permanent basis. Benjamin Franklin holds the honor of being the father of paper money. In honor of his role in this creation, the hundred-dollar bill—the highest denomination currently issued by the United States for general circulation—bears an engraved portrait of Benjamin Franklin.

Born in 1706, the tenth and last child of a Boston chandler, a candle and soap maker, Franklin grew up in a family lacking the money

and the social connections to educate him. Instead, they apprenticed him into the chandling business at the age of ten after he had completed only two years of school. At twelve, he quit his apprenticeship to become an apprentice to his half brother James, a Boston printer who published the *New England Courant*, which he had founded in 1721. James's questioning of colonial officials in his newspaper sometimes landed him in jail and in other types of trouble with the British authorities.

As a printer's apprentice, Franklin gained his education through his work. He became a skilled reader who developed a great interest in the ideas behind the documents he printed as well as in the technology of printing. Because of a stormy relationship with his brother, Franklin left Boston for Philadelphia where he found work as a printer's assistant. Then, after working in London for a brief time, he returned to Philadelphia where he and a partner acquired their own press; soon Franklin was not only publishing books but writing them as well.

Despite his lack of a formal education, Franklin became the quintessential scholar of the Enlightenment—and perhaps the most beloved of all the Founding Fathers. Through his printing, Franklin developed an early interest in the manufacture of money. In fact, he wrote one of the first pamphlets on paper money at the young age of twenty-three. At a time when paper money existed only as an emergency substitute for "real" money, he printed some of the first paper money used in America, and he continued to print money periodically throughout his life.

In 1729, Benjamin Franklin published *A Modest Enquiry into the Nature and Necessity of a Paper Currency*. The colonies attempted to follow Franklin's plan by issuing paper money, and Franklin himself was contracted to print the money issued by Pennsylvania—a service that sometimes caused his newspaper, the *Pennsylvania Gazette*, to be late in delivery. Colonial authorities in London, however, saw the issuing of paper money as an impudent usurpation of power by the colonists. In 1751 the British Parliament outlawed the use of paper money in New England and, in 1764, extended the ban to the other American colonies. In response to this parliamentary ban, Franklin

himself went to London in 1766 to petition Parliament to allow more money to be printed.

Despite his later reputation as a diplomat and scientist, Franklin supported himself throughout his life as a craftsman, using his entrepreneurial talent to run a modest printing business. At the dawn of the information age, he was an information specialist, printing and distributing the ideas of his time to an increasingly literate public. His message focused sharply on a creed of thrift, honesty, and commerce.

Franklin's commitment to his ideology is demonstrated clearly in a letter dated July 11, 1765, which he wrote regarding the Stamp Act more than a decade before the Declaration of Independence. "Idleness and pride tax with a heavier hand than kings and parliaments," he wrote. "If we can get rid of the former, we may easily bear the latter." His dicta have become a part of the American language and public psyche:

- Remember that time is money.
- Early to bed and early to rise, makes a man healthy, wealthy, and wise.
- There are three faithful friends—an old wife, an old dog, and ready money.
- No nation was ever ruined by trade.
- In this world nothing is certain but death and taxes.

Franklin's creed was not one of greed or miserliness. It was one of conscientious work. He advocated this creed not merely as a means of making individuals prosperous but as a way to improve the whole society. He believed that the world would be a far better place if everyone produced more and consumed less.

For Franklin, money always had to be made within the confines of a strict social and personal morality. Because of this, he could not sanction the enslavement of one person for the financial gain of another. Later in life, after the United States had won its independence from Britain, he turned his attention to the issue of slavery, calling for its abolition throughout the new nation.

Benjamin Franklin was a man of deep morality; yet he eschewed and even mocked the hypocrisy of established religion. He rejected religious dogma and the hierarchy of officials who dominated the church, but not the morality of religion. He had a dictum for this philosophy as well: "God helps them that help themselves."

He served the community and country well with his creed. He organized not only the first public library in Philadelphia but also a hospital, a fire department, a police department, and the Academy of Philadelphia, which became the University of Pennsylvania. He also founded a discussion group that developed into the American Philosophical Society. He helped found the U.S. Post Office and, as a convention delegate, made the census a part of the U.S. Constitution. He invented the lightning rod, bifocal eyeglasses, and the Franklin stove, which generated safe, efficient indoor heat yet released a minimal amount of smoke into the house.

In his devotion to the public good, Franklin declined to apply for a patent on his inventions; he wanted them to be manufactured by anyone who wished to do so. Such decisions kept Franklin from becoming a wealthy man, despite being quite successful throughout most of his life. He died on April 17, 1790, as a famous and much admired man but a man of only modest financial means.

A CONTINENTAL EXPERIMENT

The foundation of the United States of America offered the chance to put many of Franklin's ideas about paper money into practice. The newly forming nation provided the first modern experiment with paper money on a national scale, and the American Revolution has the distinction of being the first war to be financed with paper money, albeit a rapidly depreciating paper money.

The Second Continental Congress created paper money before it had declared independence from Britain. To enforce its claim of independence the new country needed to raise an army to fight a war, but Congress lacked the money to finance it. They issued paper bills of credit supposedly backed by gold and silver and with a stiff penalty for any traitor who refused to accept them as currency. In 1777, Congress issued \$13 million worth of paper bills called Treasury notes but

dubbed “continentals” by most people because of the label *Continental Currency* printed on them.

The continentals began with a nominal value of one Spanish milled dollar of silver, but they quickly traded at two continentals for one silver dollar. As Congress issued more continentals to pay for its prolonged war, their value declined proportionally. By the beginning of 1780, Congress had issued some \$241 million in continentals, and they were trading at a rate of forty to one silver dollar. A year later the value of the bills had dropped to seventy-five continentals to one silver dollar.⁵

In 1791, James Madison wrote for the *National Gazette* that “[t]he situation of the United States resembled that of an individual engaged in an expensive undertaking, carried on, for want of cash, with bonds secured on an estate to which his title was disputed; and who had besides, a combination of enemies employing every artifice to disparage that security.”⁶

The American Congress stopped issuing the virtually worthless paper money in 1780, but most of the states continued to issue their own paper money. By 1781 the continental had lost so much value that it gave rise to a new cliché: “not worth a continental.” Fortunately for the United States, however, Britain was giving up its struggle to hold on to the reluctant colonies and directing its commercial attention elsewhere in its search for profits.

After much debate over what to do with the continentals following the Revolution, the newly forming U.S. government agreed to redeem the continentals in government bonds paid at the rate of one cent for each continental.

The whole experiment with paper money so disgusted most Americans and provoked such a deep mistrust of paper currency that the United States printed almost no paper money for nearly a century. Even the delegates to the Constitutional Convention could not decide what to do about paper money. In Article I, Section 10, of the Constitution, they forbade the states to mandate any substance other than gold or silver as legal tender: “No State shall . . . make anything but gold and silver coin a tender in payment of debts.” Even though Article I, Section 8, of the Constitution gave the federal government

the power to regulate the value of money, the delegates could not agree on giving it the power to issue paper money. Because of grave and tumultuously voiced differences of opinion among the delegates regarding the value and usefulness of paper money, the Constitution remained silent on the federal government’s ability to issue it.⁷

For many Americans, the experiment with paper currency during the American Revolution was a great failure because they lost so much money, but to the rest of the world, the experiment appeared to be a great success because the Americans had won their war using the novel technique of issuing paper money.

THE MINT OF MAMMON

In the years following the early experiments with paper money in Europe and North America, one of the most interesting treatments of the subject was penned by Johann Wolfgang von Goethe in his poetic tragedy *Faust*. In some ways, *Faust* should be treated as two works since Goethe published Part I in 1808 but did not complete Part II until 1831, shortly before his death. The two parts represent the contrasting vision, interest, and style of a young versus an old man, and in some ways they represent the contrast between the medieval world of romance, belief, and magic and the modern world of finance, rationalism, and skepticism.

The story of Dr. Faust, as related by Goethe in Part I, was already an old one when Goethe tackled it. It deals with a medieval alchemy professor who seeks to make gold from base metals and, more importantly, to acquire ultimate knowledge about the universe and human pleasure. Toward these ends, he makes a wager with the devil, promising his soul if the devil can grant him a moment of ecstasy that Faust will want to last forever. Faust sets out on a quest that includes seducing a beautiful young maiden and abandoning the pregnant girl after killing her brother. The story told in Part I of Goethe’s *Faust* is a highly emotional tragedy written by a young genius at the start of his great career. Some scholars call it the quintessential literary work of the Romantic era.

In the second part of the play, written at the end of Goethe’s life, Faust and Mephistopheles visit the court of the emperor during the

pre-Lenten carnival season of masquerades and tricks. The emperor is besieged by his treasurer and stewards reporting the lack of funds and the need to pay the wages of the soldiers and servants. His moneylenders demand payment on debts, and even the wine bill has come due.

Mephistopheles offers the emperor a way out of his financial mess. He has found the key to making gold, the secret that all alchemists had sought for centuries. He obtains from the emperor permission to print paper money—"the heaven-sent leaf."

Faust comes to the emperor's carnival ball dressed appropriately as Plutus, the god of wealth, and through magic, he and Mephistopheles show the emperor the riches he can have by printing money. They convince the emperor to sign a note bearing the inscription "To whom it may concern, be by these presents known, this note is legal tender for one thousand crowns and is secured by the immense reserves of wealth safely stored underground in our Imperial States."⁸ He has based the value of his money on the *future* mining of gold, the untapped treasures still buried in the earth. By the next morning, the emperor has forgotten that he signed the note, but during the night Mephistopheles has had thousands of copies of it made in various denominations. The new money has been unleashed to the great joy of creditors, debtors, soldiers, and other citizens. Already people are ordering new clothes, and business booms for the butcher and baker. Wine is flowing freely in the taverns, and even the dice roll more easily. Priests and prostitutes scurry about their business with greater enthusiasm because of the new money, and even the moneylenders are enjoying a brisk new business.

"And people value this the same as honest gold?" asks the incredulous emperor. "The court and army take it as full pay? Much as I find it strange, I see I must accept it."⁹

Like John Law and Benjamin Franklin, whose experiments with money made a lasting impression on Goethe, Faust found the key to the modern economic world in money. It was a system for borrowing against future earnings and using those earnings today. With this supply of seemingly endless paper money, Faust literally remakes the land

by draining marshes, building factories and new farms, and digging canals.

Goethe had shown that the modern money economy based on its strange new money was a "continuation of alchemy by other means."¹⁰ Writing in the first decades of the nineteenth century, Goethe seemed to forecast many of the industrial achievements of that age. In other writings, he predicted the building of the Suez Canal, and nearly a century before the opening of the Panama Canal and long before the United States had made an important appearance on the stage of world history, Goethe predicted that the young nation would build a canal to connect the Atlantic and Pacific oceans. As a scientist and statesman as well as a poet and playwright, he foresaw the great accomplishments and the shortcomings of the emerging industrial world that would be financed on the newly emerging monetary system of paper money.

At first, the spread of Faust's new money brings happiness and improvement, but soon the hidden costs begin bubbling to the surface. Peasants are killed while developing their land. A new class of government functionaries arises with names such as *Quick-loot* and *Get-quick*, describing their attitudes toward life. Soon social unrest in the newly enriched nation leads to rebellion, and a new anti-emperor rises to challenge the old one.

The many versions of Faust's bargain with the devil all end the same way when the devil finally claims his due and descends with Faust into hell. Of all the writers and composers who tackled the story of the Faustian bargain with the devil, only Goethe, after a lifetime of studying human passion and behavior, gave the story a different ending. In the poem's final verses, a host of heavenly angels take the body of Faust away from Mephistopheles and sing that "for him whose striving never ceases, we can provide redemption."¹¹

The seventeenth century marked the inauspicious debut of paper money onto the modern world scene, but as demonstrated by both the French and American cases, paper money carried great potential dangers. As long as it was supported by gold or silver, all seemed well and paper seemed just as reliable, and far more convenient, than precious metals. Invariably, however, the government or bank in charge

of printing the money issued more paper than it had metal to back it. No matter how important the reason or how pressing the cause, once begun, the devaluation process spiraled, with more and more bills being issued at less and less value.

The dangers and temptations as well as the great mystery surrounding paper money weighed heavily on the thinkers and poets of the nineteenth century. In the play *Oedipus Tyrannus*, written in 1820 by Percy Bysshe Shelley, greed incites people to abuse paper money. This perspective on paper money becomes clear when Mammon appears and asks another character: "What's the matter, my dear fellow, now? . . . Does money fail? Come to my mint, coin paper, till gold be at a discount, and ashamed to show his bilious face."

Money began as a specific, tangible commodity, as cowrie shells and stone disks, cacao beans and metal nuggets. In its second stage, it came in the form of paper which retained its tangibility but lost its value as a commodity. Paper money could not be eaten, as could salt blocks or cacao beans, nor could it be melted and formed into metal tools or ornaments, like copper, tin, gold, and silver coins. Paper money lacked usefulness except as money. The use of coins and other commodities involved tremendous abstraction, but the use of paper made money even more abstract.

Whether seen as a solution to practical problems, as portrayed by Benjamin Franklin, or as a Faustian bargain with the devil, as portrayed by Goethe, paper money was to play a crucial role in the nineteenth and twentieth centuries, bringing great profit to some at a great cost to others.

9 Metric Money

Money, like number and law, is a category of thought.

—OSWALD SPENGLER

PAPER, BACKED BY GOLD, MADE POSSIBLE THE WIDESPREAD use of money. Paper expanded the role of money to new markets, new applications, and new clients. In addition to the new technology of paper, however, people also needed new ways of thinking about money. Paper could simplify the use of money, but for it to have widespread use, the intellectual system of monies had to be simplified as well. Money came in many units that were difficult to relate to one another, much less to the units of other countries. The simplification came through the gradual decimalization of money, a process that began in Russia but reached its fullest expression in the fledgling currency of the United States and later in revolutionary France.

As early as 1535 the Russians used a system of one hundred denga to one Novgorod ruble. Peter the Great upgraded the system and changed the denga to the kopek, creating a system that survived into the twentieth century.

On March 15, 1719, Peter the Great issued a royal order making one of the barracks in his new capital into the city's first mint. The equipment in the Moscow mint was then moved to Saint Petersburg in order to make the czar's new coins, the first of which were merely silver coins from other countries, which the Russian mint restruck in Peter's honor.