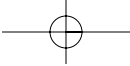


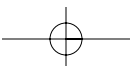
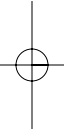
A METAL FOR ALL SEASONS

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1

Get Gold at All Hazards

If gold were more plentiful on earth—say, as abundant as salt—it would be far less valuable and interesting, despite its unique physical attributes and beauty. Yet gold has been discovered on every continent on earth. That sounds like a contradiction, but it is not. Although gold deposits are widespread, in one form or another, no one area has yielded its gold easily. Finding and producing gold demands immense effort relative to the amount of glittering yellow metal that makes its appearance at the end of the process.

For example, in order to extract South Africa's annual output of around five hundred tons of gold, some seventy million tons of earth must be raised and milled—an amount greater than all the material in the pyramid of Cheops.¹ The South African mines are the worst, but we are all familiar with the tales of the Forty-Niners panning day after day in the waters of California and ending up with nothing but a few dribblets of gold. As Will Rogers put it after returning from a visit to the Klondike, “There is a big difference between prospecting for gold and prospecting for spinach.”²

This radically distorted ratio of effort to output appears to have done little to discourage people from pursuing the worldwide search for gold—perhaps the most telling evidence of how highly prized, vital,

essential, and irresistible gold has been from the earliest of times. Even in myths, as this chapter relates, the quest for gold was gluttonous.



Although gold does not mix with other metals, thin veins of it are scattered throughout the mountains where granite and quartz have filled in cracks in the earth's crust and have been pressed together by fierce heat over millions of years. The elements have washed, blown, and scattered these deposits over the years, but gold has retained most of its purity even as it has suffered the ravages of nature's dynamics. Much of this gold has flowed downward in mountain streams. Gold's high density and weight tend to separate it from the other material in the waters, where it drifts to the bottom as nuggets or flows along as fine as dust.

Relative to the needs for it, gold does appear to have been more plentiful in ancient times, especially in Egypt and the Near East, than it has been since the Roman era. A little bit of gold goes a very long way when it is used only for adornment and decoration and not for coinage or hoarding: mining by the Egyptians produced only about one ton annually.³ Until the development of coinage, which put gold into the hands of the masses and greatly expanded the need for it, most of the available gold was owned by monarchs and priests. Its use was ceremonial in large part, a medium for advertising power, wealth, eminence, and proximity to the gods. Whatever was left over was used for jewelry and other forms of personal adornment.

When Moses came down from Mount Sinai to deliver the Ten Commandments to his people, he found the Jews in a delirium worshipping a golden calf. He was so enraged to see them bowing to an icon like those worshipped by the hated Egyptians that he smashed the tablets inscribed with the Word of God—the Ten Commandments—which he had just brought down from Mount Sinai. The story reveals that the Jews, even as slaves, had ample amounts of gold on their persons. It never occurred to them to use their gold to bribe themselves out of captivity in Egypt; as gold was not yet perceived as money, they would have found few takers. Until they melted their gold into the golden calf, they adorned their ears, arms, and necks with it.

The more than four hundred additional references to gold in the Bible confirm how plentiful gold was at that time. Poor Job declaims, “If I have made gold my hope, or have said to the fine gold, ‘Thou art my confidence’; If I rejoiced because . . . my hand had gotten much. . . . This also were an iniquity to be punished by the judge; for I should have denied the God that is above.”⁴ Abraham, the founder of the Jewish nation, is described in Genesis 13 as “rich in cattle, and in silver, and in gold.” He furnished the servant who went to fetch Rebecca with vessels of gold, including a nose ring.

When Moses climbed Mount Sinai to receive the Word from God, God gave him a lot more to do than just transmit the Ten Commandments and many associated rules and obligations. God also issued precise directions for the construction of a sanctuary where the Jews were to worship Him, together with a tabernacle to go inside the sanctuary. God began right off by specifying that “thou shalt overlay it with pure gold, within and without shalt thou overlay it, and shalt make upon it a crown of gold round about.” That is just the beginning: God even ordered that the furniture, fixtures, and all the decorative items such as cherubs were to be covered in pure gold. The instructions, as they appear in Chapters 25–28 of Exodus, persevere for some eighty paragraphs of painstakingly detailed measurements and designs.

Once settled in the Promised Land, the Jews must have accumulated masses of gold, primarily from plundering the tribes they had defeated in battle. Moses and his troops took over three hundred pounds of gold from the Midianites, “jewels of gold, ankle-chains and bracelets, signet-rings, earrings, and armlets.”⁵ Gold gleamed from the walls of the interior of Solomon’s great temple (whose western wall is the Wailing Wall of modern Jerusalem), which was 135 feet long, 35 feet wide, 50 feet high, and divided into three chambers. Solomon enjoyed lavishing gold on his personal possessions as well: his shields were made of gold, his ivory throne was overlaid with gold, and he sipped his wine from golden vessels.⁶ When the queen of Sheba came to visit Solomon, she brought him an amount of gold (coals to Newcastle?) that has been estimated at as much as three tons—worth over \$20 million at today’s prices.⁷

The sanctuary and tabernacle that Moses built to God’s protracted specifications have disappeared, and Solomon’s massive gold-encrusted temple has been defaced. But in AD 532, after ten thousand men working for six years had used more than twelve metric tons of gold in building

the church of Saint Sophia in Constantinople, the Byzantine emperor Justinian—who supervised the entire operation—could exclaim, “Solomon, I have surpassed thee!”⁸ Justinian was well versed in the uses of gold. He inherited 320,000 pounds of gold, used it all up, and then taxed his subjects to pay mercenary armies, to finance public works, and, most of all, to bribe his enemies to refrain from invading his domains. The process of using gold to proclaim the power of the church would be repeated in gleaming golden mosaics and decoration throughout Italy, in Spain, and even on the wildest steppes of Russia.



Neither Solomon nor Jehovah himself were the first to use gold to inspire reverence. The ancient Egyptians probably set the style for later religions, including the Jews, to emulate. The Jews, with one god, had it easy compared with the Egyptians, who had two thousand deities to worry about, many of whom bore some relation to the all-powerful Sun God. You can consume a lot of gold convincing everyone how powerful and all-knowing two thousand deities are. Christians, with only one god to worship but several thousand saints to pray to, have faced similar problems.

The use of gold in Egypt was a royal prerogative, unavailable to anyone but the pharaohs. That constraint facilitated the way that the pharaohs assumed god-like roles and authenticated their heavenly character by adorning themselves with the same substance that embellished their gods. Creating gold jewelry in Egypt was a high art, lavished upon dead monarchs as well as live ones.

An impressive demonstration of the use of gold to project power was carried out by a fascinating pharaoh who happened to be a woman, described by the Egyptologist James Henry Breasted as “the first great lady of the world.” Hatshepsut was the daughter of Thutmose I, who was the first pharaoh to be buried, about 1482 BC, in the Valley of the Tombs of the Kings at Thebes. After Hatshepsut seized power from her nephew-stepson around 1470 BC, she sat on the throne as king until her death about 1458 BC and was known by approximately eighty titles, including Son of the Sun and Golden Horus (the Egyptian god of light). Although she passed up the opportunity to add the traditional

royal title of Mighty Bull, she was nevertheless depicted in most contemporary art as a man.⁹

Hatshepsut was an impressive woman by any standard. She managed a major increase in Egyptian trade with Palestine, Syria, and Crete, which had withered during the preceding 150 years when Egypt was occupied by Asian invaders known as the Kyksos. The explorations for gold during her reign were ceaseless, reaching farther and farther south, probably well into Zimbabwe.

Hatshepsut's demand for gold was enormous, because she was a builder on a scale that would put Louis XIV and his Versailles to shame. She was also fond of gilding her face with a mixture of gold and silver dust. When she decided to erect a great monument for Amon Re, the chief god of Thebes, her original design included two gold pillars one hundred feet high that would be seen above the walls of the Karnak complex, which covered an area larger than the Vatican. When her chancellor prevailed on her to be a little more economical, she built the pillars of granite and covered only their peaks with gold. But even that required generous amounts. When the job was complete, she declared, "Their height pierces to heaven. . . . Their rays flood the Two Lands when the sun rises between them. . . . You who after long years shall see these monuments will say, 'We do not know how they can have made whole mountains of gold.'" ¹⁰



Most of the gold of biblical times and ancient Egypt—approximately four thousand years before Christ—came from the bleak and forbidding landscape of southern Egypt and Nubia; *nub* is the Egyptian word for gold. Nubia continued to supply gold to the Western world well into the sixteenth century. According to one authority, the output of the Nubian mines "far exceeded the quantity which was drawn from all the mines of the then known world in subsequent ages, down to the discovery of America."¹¹

The Egyptians had developed these mines from shallow ditches, but in time they cut complex underground shafts deep into the hills. The deeper the mines were cut, the greater the human pain that went on inside. The best description we have of the horrors experienced by the

workers in these mines has been provided by Diodorus, a Greek who visited Egypt about the time that Caesar ruled Rome. The air in the shafts was fetid, constantly depleted by the tiny candles that barely illuminated the terrible darkness. The heat was intense, the earth frequently gave way, and subterranean water was a constant hazard. The fires used to crack the quartz in the rock released arsenic fumes that caused excruciating deaths among the many who inhaled them. The slaves had to work on their back or side and were literally worked to death if they were not crushed to death by falling rocks before they expired from exhaustion.¹²

No wonder slavery was so prevalent—and warfare so important—as military victories brought fresh supplies of slaves to work the mines. Diodorus informs us that the kings of Egypt did not limit the slave population to notorious criminals or captives taken in war, but even their “kindred and relations” as well—men, women, and children under the lash of the whip and without housing or care of any kind.¹³ In an ingenious arrangement, the slaves were guarded by mercenaries drawn from many different nations. As none of them spoke the language of the slaves, there was little opportunity for the slaves to corrupt or to conspire with their guards in order to effect escapes.¹⁴

The employment of human labor was the standard mining technique right up to the twentieth century, except for a process that the Romans had devised in Spain, whose gold-stuffed hills served as the backbone of the Roman economy. The Romans originally used human labor to dig as deep as 650 feet to extract the ore from the Spanish countryside, but with a new method, called hydraulicking, they used powerful jets of water to break up the rock and expose the gold-bearing earth. The water came from great holding tanks situated as much as four hundred to eight hundred feet above the site. The method, though wonderfully efficient and productive, washed away entire mountains, destroyed farmland, and silted many rivers and harbors.¹⁵

Hydraulicking was used in spotty fashion in other parts of Europe as well, but its most notable reappearance was in California in 1852, at the height of the gold rush. The Roman technique was faithfully reproduced in the Sacramento area, with water under pressure of up to thirty thousand gallons a minute smashing into the rocky hillsides and mountains. The environmental damage was awful. Forests and farmland disappeared in short order, the detritus even pouring into San Francisco Bay and leaving the landscape dotted with piles of rock and barren moun-

tainsides. Nevertheless, hydraulicking was the primary method of gold extraction in California until 1884, when angry citizens finally had it outlawed.

Today, in the great gold mines of South Africa, the shafts reach down as far as twelve thousand feet and the temperature reaches 130° F. As one source describes it, “To produce one ounce of fine gold requires thirty-eight man-hours, 1400 gallons of water, electricity to run a large house for ten days, 282 to 565 cubic feet of air under straining pressure, and quantities of chemicals including cyanide, acids, lead, borax, and lime.” The labor force employed in the South African mines exceeds four hundred thousand men, about 90 percent of whom are black.¹⁶

King Ferdinand of Spain coined immortal words in 1511 when he declared, “Get gold, humanely if possible, but at all hazards—get gold.”¹⁷



Not all gold has to be mined. When gold is carried down by mountain streams, the prospector can wade in and sieve up the fragments of gold-bearing ore that have broken loose from the mountainside. Gold was collected long ago in this fashion in Asia Minor, where gold coinage first made its formal appearance. Some 3500 years later, the California gold rush of the nineteenth century began on the banks of the Sacramento River, when the Forty-Niners crowded into the river with their crude equipment to “pan” the gold out of the rushing waters.

They were following a practice that had come down from the ancient Greeks, who used woolly sheepskins for panning gold from the rivers—the tight curls of the sheep’s coat did an excellent job of capturing and holding the fragments of gold as the waters came rushing down the mountainsides. The mention of fleece and gold together immediately evokes Jason and the Golden Fleece, a legend that is worth a brief digression for its moral.¹⁸

Phryxus, the son of the king of Boeotia, an area in eastern Greece, had been badly treated by his stepmother, so his own mother arranged for him and his sister to escape on the back of a winged ram whose fleece was pure gold, a handsome gift that she had received from Hermes (for services undefined). The trip could hardly have been smooth, because

the Golden Fleece must have weighed heavily even on a ram delivered by Hermes. Phryxus's sister, Helle, was apparently susceptible to air sickness, and, lacking the facilities of modern aircraft, became dizzy and fell off the ram into the sea; the point where she landed was named after her as the Hellespont.

Phryxus held on. After a trip of over one thousand miles, he was finally delivered by his ram to Colchis on the far eastern side of the Black Sea. Happy to be safe and alive, he sacrificed the ram to Zeus and presented the fleece to the local king, Aeetes. Aeetes was delighted, as he had been told by an oracle that his life depended upon his possession of this fleece. Consequently, he nailed the Golden Fleece to a tree in a sacred grove and hired a huge, bloodthirsty dragon to guard it.

Meanwhile, back in northern Greece a king named Pelias decided he had better get rid of his handsome and popular nephew Jason, who was trying to assert his family's claim to the throne. Pelias told Jason that he could have the throne if he would first perform a deed "which well becomes your youth and which I am too old to accomplish. . . . Fetch back the fleece of the golden ram. . . . When you return with your magnificent prize, you shall have the kingdom and the sceptre."¹⁹ Pelias never dreamed that Jason would succeed and return one day with his magnificent prize; on the contrary, he fully expected Jason to perish along the way or at least in the jaws of the guardian dragon.

Jason did take the Golden Fleece, with the help of his Argonauts, but only after an extensive and prolonged series of hair-raising adventures. Even then, he would have failed had it not been for the assistance he received from Aeetes's daughter Medea, who possessed magic powers. Medea had been hit with a dart thrown by Eros and had fallen madly in love with Jason, so she used all her wiles to catch his fancy. Jason was sufficiently tempted by her to offer to take her back to Greece with him, but on the condition that she support his efforts to take the Golden Fleece. Much as she loved him, Medea was unwilling to yield to what might well have been a seductive ruse. "O stranger," she cried, "swear by your gods and in the presence of your friends, that you will not disgrace me when I am alone, an alien in your land."²⁰ Jason swore to make her his "rightful wife" as soon as they returned to Greece. As such oaths were guarantees as reliable as written contracts in our time, Medea delivered the goods by singing the dragon into drowsiness while Jason seized the Golden Fleece from the tree.

The story does not have a happy ending, because Jason was a compulsive social climber. From the outset, he was determined to become king of his homeland. He risked his own life and those of his friends in search of a sheepskin dusted with gold. He used a king's daughter to bear children and promised to marry her. When he returned to Greece and found that he could not succeed to the throne, he fled with Medea to Corinth. There he proceeded to woo the daughter of King Creon but he told Medea what he was up to only after Creon had agreed to his betrothal to the princess. When Medea, inconsolable, recalled to him his solemn oath in Colchis, Jason justified himself by saying that their children would be better off because his newly betrothed had better social and political connections in Corinth than Medea did. The only solace he offered her was some gold and a request to friends to provide her with hospitality.

Medea fixed him. With a fine touch appropriate to the occasion, she created a gorgeous gown made of cloth of gold and drenched it in poison. She then presented it as a gift to the bride-to-be. Delighted at the sight of this beautiful garment, the poor young woman wrapped herself in the radiant fabric, twined the golden wreath into her hair, and died a horrible death. Medea then completed her act of revenge by killing her own sons and flying off in a dragon-drawn chariot she had conjured up. Jason threw himself on his sword and died on the threshold of his home.

The gold of Aetes's fleece had promised Jason power. That power gained him a princess who promised him a throne. But in the end, it was the gold that snuffed out both his bride and his future.