PABLO AND THE PUMPKIN

We can't verify the scientific accuracy of this story... but it's a pretty entertaining Mexican folktale.

LAZY BOY

Once there lived a boy named Pablo. His home was in a deep valley near a tall mountain. Long, long before, the mountain had erupted and had spouted forth something magical on the land below, and because of this, crops grew fast on the farm where Pablo lived. If his father planted corn, the full-grown ears were ripe in a week. If pumpkin seeds were planted, the pumpkins had to be picked in a few days, otherwise they would become too heavy to carry. As for weeds—they were knee-high an hour after they had sprouted.

With things growing so fast, much work was necessary. But Pablo was very lazy. He liked to sleep, and he hated being out in the hot sun. Many times his father had to scold him before he would do any work. One hot afternoon he had to shake the boy hard in order to rouse him.

"You will get no supper until the hoeing is done!" he told Pablo.

So Pablo yawned and stretched, and went out to hoe the field. For an hour he did very well...but then he started to grow tired and sleepy. Sitting in the shade of a cornstalk with his hoe and weeding knife at his side, he rested his head on a pumpkin. And in two minutes Pablo was asleep.

A WHOLE NEW WORLD

Pablo slept...and slept...and slept. And the cornstalk and pumpkin grew and grew. As the corn grew taller, the pumpkin vine became tangled around it and the pumpkin was lifted off the ground along with Pablo and the hoe and knife. But still Pablo slept.

The cornstalk grew taller and taller until no tree in the world could equal its height. It had produced many ears, and the seeds from some of them had sprouted and made still more ears of corn. Mean-

while, the pumpkin had become many miles thick.

After a long time Pablo rubbed his eyes and sat up. What kind of world was this, he wondered. The ground was hard and yellow like a pumpkin. Corn was growing all around. He looked about him. His home was nowhere in sight. He couldn't understand this, for it had been in plain view from the field.

He looked at his feet and saw that his trousers reached only to his knees. He couldn't understand it—when he had put them on, they had come down to his ankles. His shirtsleeves were short, too. His hair had grown down to his shoulders. Poor Pablo! He didn't know what to think or do!

"How long have I been here?" Pablo asked himself.

MR. SPACEMAN

He was hungry, so he ate some corn. He cut off a piece of the ground, and it tasted like pumpkin! He was fond of both corn and pumpkin, so his hunger was satisfied. Then he began to grow cold. In his pocket he had a piece of flint rock; with it he started a fire, using some dried cornstalks.

A long, long distance away, down on the Earth, a little girl stood in front of her home. It was dark, and she was gazing at something high above her. "Mother! Mother!" she cried. "There is a round, shining ball in the sky! Come and look at it!" Her mother came, and the two watched the strange sight.

GROUND CONTROL

"Why, there is somebody on it!" exclaimed the mother. "I can see his face! He has a stick in his hand!"

"Yes," replied the girl. "He is building a fire. I hope he does it every night."

"We must not expect too much, Daughter," the woman said. "Some nights he may need only a small fire and on others no fire at all. On those nights there won't be much light in the sky, or perhaps none at all."

"But I am glad to see the nice light," said the girl. "It will make the nights brighter."

"Suppose we give our new sky-friend a name and look for him tomorrow night," suggested the mother. "What name shall it be?"

After the girl thought a minute, she answered, "Let's call him the Moon!" And so it has been called ever since.

THE MERCENARIES

In July 2008, former British Army officer and admitted mercenary Simon Mann was sentenced to 34 years in prison for attempting to overthrow the government of the African nation of Equatorial Guinea. It made us want to know more about mercenaries in general—and this is what we found.

BACKGROUND

Mercenaries—foreign soldiers who fight for money rather than for a moral or legal attachment to a country or cause—have been employed by warring governments for thousands of years. History's best-known wars, from ancient Greece and Rome to World War I and every war since, have seen "soldiers of fortune" on both sides—the practice was commonplace. It wasn't until modern times that fighting and killing for nothing more than money—and the corollary, paying people to fight—has come to be seen as something immoral. The word "mercenary" itself has negative connotations. Most countries today have banned the use of mercenaries, but they do, of course, still exist. The following is a rundown of just some of history's most intriguing and infamous soldiers of fortune, starting more than 4,000 years ago.

THE MEDJAI

Weni the Elder was one of ancient Egypt's most renowned military commanders. Serving under Pharaoh Pepi I (2283 B.C.), he instituted many changes that affected Egyptian—and regional—armies for millennia. One of them: hiring foreign fighters to bolster his forces. Many were from Nubia, to Egypt's south, and among them were the *Medjai*, seminomadic desert people revered for their fighting skills and their courage. Numerous sculptures, paintings, and engravings depict these distinctive fighters: dark-skinned Africans wearing short, skirtlike garments and carrying bows and arrows. For more than 1,500 years, the Medjai culture interwove with the Egyptian, so much so that during times of peace the Medjai stayed in Egypt, working as bodyguards for royalty. The word "medjai" itself even later became associated with a police force within Egypt itself. If you've seen the 1999 film *The Mummy* you've heard of the Medjai. They're depicted as warriors that have

been guarding the mummy's tomb for millennia, since the ancient Egyptians first hired them to do so. (Except in the film...they're Caucasian.)

JEWS FOR PERSIA

In the late 1800s, several ancient writings were discovered on the Nile River island of Elephantine in the south of Egypt. The "Elephantine Papyri," as they're known, were written in the 5th century B.C., when the Persians ruled Egypt. They tell of a community of Jewish mercenaries—and their families—living on the island. Exactly when they first got there is unknown. Some historians believe they may have been loaned to an Egyptian Pharaoh by an earlier king of Judea (part of modern-day Israel), perhaps as early as 700 B.C., and that they later remained as mercenary soldiers when the Persians conquered Egypt in 525 B.C. Several generations of the foreign fighters lived on Elephantine for at least 200 years as a well-established and respected class of citizen.

THE CELTS

Most people are probably familiar with the Carthaginian general Hannibal, who led an army and several elephants across the Alps around 210 B.C. and almost conquered the Romans. What you probably don't know is that at least 3,000 of his soldiers were Celts, better known today as ancestors of the British. Celtic people actually settled in numerous regions throughout Europe and Asia Minor starting in the 600s B.C. And wherever they went, it seems, they earned a reputation as some of the fiercest and wildest fighters in history. When they weren't fighting for themselves they were often fighting for someone else for pay. That included ancient Egyptians, Syrians, and Palestinians in the Middle East; the Spartans, Macedonians, and other Greek city states before the Romans conquests of 146 B.C.; and very often the Romans (who, remember, they also fought against), until the Roman Empire fell, around 400 A.D.

THE CELTS, AGAIN

In 1259 Aed O'Connor, prince of Connaught in the West of Ireland, married a princess from the Hebrides islands of Scotland. She arrived in Ireland accompanied by 160 Scottish warriors who

became known as the *Galloglaich* (pronounced "galloglas"), meaning "foreign young warriors" in Irish Gaelic. Organized, experienced, well equipped, and brutal, they and their descendants became a large and vital part of Irish armies that fought the English for the next 350 years. By the 1500s, more than 5,000 Galloglaich were fighting in Ireland. They were well respected *and* well paid: Records show that each soldier got 12 cattle per year, as well as food in the form of butter and grain. Commanders got even more, often including land, and many became wealthy and lived as Scottish lords on Irish soil. By the late 1500s, however, methods of warfare were changing drastically: Muskets and cannons were becoming more common, and the hand-to-hand combat the Galloglaich specialized in became obsolete.

THE *REISLÄUFER* OF SWITZERLAND

It's ironic that the nation now known as a permanently neutral bastion of peace once bred some of the most organized and brutal mercenaries in history. From the 1300s through the 1500s, if you had a war to fight in Europe, you called the Swiss. Local *cantons*, now Swiss counties but then controlled by regional lords, kept large contingents of *Reisläufer*—"ones who go to war"—ready to rape and pillage for the right price. Hire them, and your enemy would encounter a massive and deep column of men with *pikes* (thick, long, pointed sticks) and *halberds* (a combination pike and axe) who would put their heads down and rush into battle, slaughtering everything in their path. In 1515 the Swiss began their famous tradition of neutrality, and the days of the Reisläufer were over.

THE HESSIANS

Whom did the Americans fight during the Revolutionary War? The British, of course. And the Germans. King George III made deals with German lords to have German soldiers shipped to America to help fight the rebels. An estimated 30,000 German soliders made the trip, the majority from the region of Hesse, hence the name. One of the war's most famous battles, in fact—the Battle of Trenton—involved Hessians: When General George Washington led his troops across the Delaware River on Christmas night 1776 (picture the painting), on a sneak attack of a gar-

rison in New Jersey, the soldiers he met were Germans—1,400 of them, commanded by Colonel Johann Gottlieb Rall. Washington's men won in a rout and more than 900 Hessians were captured. (The famous "Headless Horseman" from Washington Irving's 1820 tale, *The Legend of Sleepy Hollow*, was based on the tale of a ghost of a Hessian soldier from the Revolutionary War.)

MODERN TIMES: "MAD MIKE" HOARE

Thomas Michael Hoare was an Irishman, born in 1920, who served the British in North Africa during World War II. After the war he moved to South Africa, where he became one of the most notorious mercenaries in modern history. He lived the high life in South Africa in between stints leading his "Wild Geese" mercenary troops in wars in the Congo, Angola, and South Africa from 1961 though the 1970s. (They were the inspiration for the 1978 film *The Wild Geese* starring Richard Burton, Richard Harris, and Roger Moore.) Hoare's downfall came in 1981 when he and a force of 43 soldiers made a botched attempt to overthrow the government of the island nation of the Seychelles in the Indian Ocean. They ended up hijacking a plane to get back to South Africa, where all of them were arrested. Hoare served four years in a South African prison—not for attempting to overthrow a government, but for the hijacking. An inquiry later found that South African Defense Force officials, and possibly French and American intelligence officials as well, were involved in the planning and financing of the attempted coup.

EXECUTIVE OUTCOMES

If you are in need of some hired killers with a respectable corporate feel—these are your guys. EO was incorporated as a "private military company" around 1990, just after the fall of the apartheid regime in South Africa. The first leader of the group: Eeben Barlow, former leader of South Africa's eerily-named Civil Cooperation Bureau (CCB), a covert group whose job it had been to perform "black ops" against black South African organizations. EO didn't just have a few mercenaries to offer: they claimed to have more than 3,000 highly-trained soldiers, plus weaponry including guns, anti-aircraft missiles, tanks, planes—you name it. They were a war waiting to happen...for a price. In the 1990s, they fought

Super Bowl XXVI, in 1992, was the first Super Bowl at which the National Anthem...

battles in Angola, Sierra Leone, and Indonesia, to name just a few. They were also hired by multinational corporations for "security," including—allegedly—De Beers, to protect diamond mines, and Chevron and Texaco, to protect oil drilling operations in Africa. EO disbanded in 1999 (maybe).

SIMON MANN

Mann was born in 1952 and, like Mike Hoare, was a former British military officer. He became involved in Executive Outcomes in the 1990s, then started his own mercenary outfit, called Sandline International, in 1996. Sandline mostly fought rebel groups in African countries, but became well known internationally when an attempt to put down a rebellion in Papua New Guinea—for which Sandline charged $36 million—went awry and led to the toppling of the nation's government. Things went awry again in 2004 when Mann and 69 mercenary troops attempted to take over Equatorial Guinea in Central Africa. At the behest of a group supporting exiled ex-president Severo Moto, they were arrested on the way there—in Zimbabwe—and after years of legal wrangling, Mann was sentenced to 34 years in prison in Equatorial Guinea. Mann claimed the coup was planned and financed by a reclusive London oil tycoon (Equatorial Guinea has *a lot* of oil) named Ely Calil. Mann said the goal of the operation was to install exiled opposition leader Severo Moto, who was living in Madrid, as president. Calil admitted involvement, but said he thought Mann and his mercenaries were simply going to provide Moto with security for a trip to Equatorial Guinea. Calil was never charged with a crime. Mann also named Mark Thatcher, son of former British Prime Minister Margaret Thatcher, as a financier and member of the "management team" of the coup plot. In 2005 Thatcher pleaded guilty to being "unwittingly" involved, and was fined $500,000 and given a four-year prison sentence (suspended).

* * *

ACTUAL NEWS ITEM

"An Australian Army vehicle worth $74,000 has gone missing after being painted with camouflage."

...was performed in sign language as well as sung.

THE COMSTOCK LODE, PT. I

Practically everybody has daydreamed about prospecting for gold and striking it rich. But what happens after the big strike? Here's the amazing tale of one of the biggest bonanzas in U.S. history.

KILLING TIME

In January 1848, gold was discovered at Sutter's Mill, California, sparking the Gold Rush that brought more than 300,000 people to the territory. In the spring of 1850, some prospectors heading for the California gold fields stopped at the foot of the Sierra Nevada mountains about 20 miles outside of modern-day Reno, Nevada, to wait for the snow to melt before they continued over the mountains. Why not look for gold while they waited? They fanned out along the Carson River's edge and up a stream that fed into the river from a nearby canyon. And sure enough, they did manage to find some gold...but not enough to justify staying put. So after the snow melted a few weeks later, they moved on to California. Before they left, though, they named the spot "Gold Canyon."

PAY DIRT

Word of the discovery at Gold Canyon spread, and each spring as a new wave of settlers and prospectors headed to California along the same route, many stopped there long enough to pan for gold. As the years passed and the original deposits were played out, prospectors started exploring farther afield. In January 1859, a prospector named James "Old Virginny" Finney and three friends took advantage of some good weather and went prospecting on top of a low hill in Gold Canyon where the dirt was yellower than in the surrounding lowlands. Old Virginny thought that was a good sign. When they started testing the soil, each pan yielded about 15¢ worth of gold. Not exactly Sutter's Mill, but it was enough to justify staking a claim and exploring the area further.

In those days, tradition and mining law dictated that no miner could stake a claim larger than he could work himself. Old Virginny and his associates each filed a claim for a 50-by-400-foot area, and over the next few days some other miners filed adjacent claims. Many more made trips to the site to look around, but for

most of them, 15¢ a pan wasn't enough gold to make them abandon the claims they were already working.

DOWNS AND UPS

When Old Virginny and the others finished washing all the surface dirt through their "rockers"—mining equipment resembling baby cradles that rocked back and forth to separate out the gold—they dug deeper. As they did, the amount of gold steadily increased, first to $5 per day for each miner, then $12, and for a time as high as $20, at a time when gold sold for $13.50 an ounce.

So why isn't the Comstock Lode known as the Finney Lode or the Old Virginny Lode? Because as the months passed and the miners dug deeper, they eventually hit a deposit of difficult-to-work clay that had very little gold in it. Most deposits of gold are small, so when the miners ran out of the easy diggings they assumed they'd found all there was. That's what happened to Old Virginny: the gold ran out, so he moved on.

That June, just a mile down the hill, two miners named Peter O'Riley and Pat McLaughlin struggled to make a profit on a 900-foot-long claim they'd staked for themselves. The claim was yielding only one or two dollars' worth of gold a day, and the men had heard about richer claims near the West Walker River, about 25 miles away. But they decided to stick around a little longer, probably until they made enough money to pay for the move.

It takes water to sift gold out of sand and dirt, and the closest water source was a tiny spring that the men decided to dam up with some strange bluish sand they'd uncovered nearby. Almost on a whim, they tossed some of the odd sand into the rocker to see if it contained any gold. It was heavy and difficult to work with, but when they cleared it away they were stunned to see that the entire bottom of the rocker was covered in a layer of shimmering gold. Where Old Virginny had recovered gold by the ounce, O'Riley and McLaughlin were mining it by the *pound*.

RANCHO COMSTOCKO

So why isn't the Comstock Lode known as the O'Riley Lode or the McLaughlin Lode? Because later that same day, another miner, Henry "Old Pancake" Comstock, happened to ride by while the men were celebrating their good fortune. When Comstock saw

the gold, he hopped off his pony and told the two men that they were prospecting on land that he and a partner had already claimed for a ranch. In those days, you could claim unoccupied land for a ranch just as easily as you could stake a mining claim. Comstock told the "trespassers" that if they would let him and his partner, Emmanuel Penrod, become equal partners in the claim, he wouldn't take them to court. Furthermore, if he and Penrod were given 100 feet of the claim to work by themselves, he'd even let them use the water from "his" stream.

DEAL OR NO DEAL

Nearly 150 years have passed since then, and in all that time no record of a ranch claim by Comstock has ever been found. But O'Riley and McLaughlin didn't know that, and in those days it was common to settle mining disputes quickly without resorting to lawsuits—why waste money on lawyers when nobody knew how long the gold would last? Even the best claims might peter out after a month or two.

O'Riley and McLaughlin took the deal...and Comstock started getting credit for their discovery. Comstock "was the man who did all the heavy talking," Dan DeQuille wrote in his 1876 book *A History of The Big Bonanza*. "He made himself so conspicuous on every occasion that he soon came to be considered not only the discoverer but almost the father of the lode. People began to speak of the vein as Comstock's mine, Comstock's lode...while the names of O'Riley and McLaughlin, the real discoverers, are seldom heard."

THE BAD WITH THE GOOD

Beneath the crumbly blue dirt was a firmer, compacted blue stone that yielded even more gold. On good days, the men pulled more than $1,000 worth of gold from the earth, more than 5½ pounds of gold a day. When the men hit a *really* rich patch, they might collect $150 worth in a single pan of dirt. The only frustration was the fact that the strange blue dirt clogged the rockers and other mining equipment terribly. "For weeks they let it go to waste," DeQuille wrote, "throwing it anywhere to get it out of the way. They not only did not try to save it, but constantly cursed it. It was the great drawback."

Hey, who said life was fair? Part II of the story is on page 222.

THE COMSTOCK LODE, PART II

Here's the second installment of our story on one of the most famous mining strikes in American history.
(Part I is on page 47.)

GET A LODE OF THIS

When you're pulling gold out of the earth by the pound, word of what you're doing has a way of getting out. In June 1850, a rancher named B. A. Harrison, living in Truckee Meadows, about 10 miles away from the Comstock mine, learned of the strike and went to see it for himself. He collected some samples and brought them to the town of Grass Valley, where he gave pieces to friends. One of them, a local judge (and a miner) named James Walsh, had the ore "assayed," or analyzed, to see what was in it and how much it was worth.

The assayer estimated that an average ton of the ore would yield about $969 worth of gold. No surprise there; Harrison and Walsh knew there was plenty of gold in the ore. But what really stunned everybody—including the assayer, who was so incredulous that he tested the ore a second time—was that each ton would also yield nearly $3,000 worth of *silver*.

Silver? What silver? The assayer explained to Harrison and Walsh that the blue dirt that had proved so frustrating to the prospectors was actually *silver sulfide*, or silver ore, and a very rich deposit of it at that. It was, according to the experts, "an almost solid mass of silver." As Harrison had seen with his own eyes, the exasperated prospectors had already dug up tons and tons of the blue ore and were dumping it in huge waste piles all over the place. They had absolutely no idea what they had stumbled onto.

SHHH!

That night, Harrison, Walsh, and a few other associates made plans to sneak out of town the following morning without attracting attention, so that they could stake their own claims next to the existing ones and maybe even buy out the original claims if

they could. But who could keep that big a secret? If you won the lottery on Monday evening, could you really keep it to yourself until Tuesday morning? At least one person must have talked, because by the time the men were ready to leave the following morning, Grass Valley was buzzing with news of the discovery.

SEEING IS BELIEVING

It took just days for word of the strike to spread from Grass Valley to the California gold country. Soon miners who'd been unlucky there began abandoning their existing claims and heading east. But the real rush didn't begin until after Judge Walsh had shipped nearly 40 tons of the ore to San Francisco in fall of 1859, where it yielded more than $118,000 worth of gold and silver.

Many of San Francisco's leading citizens were men who had struck it rich during the gold rush of 1849 and had managed to hang onto their money since then. They weren't the kind of fellows who took to the hills chasing every rumor of a new strike. But seeing the newly minted bullion in the offices of Walsh's bankers made believers out of everyone, and soon they, too, were on their way over the Sierra Nevadas. By the first week of November, when snowfall blocked the mountain passes for the rest of the winter, several hundred people—from the wealthiest speculators to the lowliest prospectors—had made their way to the area and were riding out the winter in tents or whatever shelter they could improvise.

DOWN...AND OUT

Mining the surface gold and silver out of a deposit like the Comstock Lode is easy enough: the ore was so soft, in fact, that it could be mined with just a shovel. But once all the surface ore is gone and prospectors have to start digging deeper into the earth to get at the rest, mining becomes a much more dangerous and expensive proposition. And who knew how long the rich deposit would hold out? Each time the prospectors lifted a spadeful of ore, they faced the very real prospect of finding nothing but worthless dirt or rock underneath.

The thinking among experienced prospectors was that the best way to profit from a lucky strike was to sell out *before* the limits of the strike had been discovered—hopefully at top dollar to feverish

investors foolish enough to think the good times would last forever. So when the big money boys from San Francisco rolled into camp, many of the original claim holders sold out for what must have seemed like obscene profits at the time and happily went on their way.

FINDERS, WEEPERS

Pat McLaughlin sold his claim for $3,500. His partner, Peter O'Reilly, held out the longest of all the original stakeholders, eventually selling out for $40,000, after collecting about $5,000 in dividends.

Henry Comstock sold his claim to Judge Walsh for $11,000 and used the money to open mercantile stores in Carson City and Silver City, both of which he hoped would profit from the mining trade he'd helped create. No such luck—both stores failed. Comstock spent the rest of his life roaming the American West, looking for a second mother lode. No luck there, either. In September 1870, Comstock—by now broke, broken, and mentally deranged—committed suicide in Bozeman, Montana.

NAMING RIGHTS

Old Virginny, the man who made the first discovery, was also one of the very first to sell out, reportedly surrendering his interest in the mine for "an old horse, worth about $40, and a few dollars in cash." Another version of the story says he got a couple of blankets and a bottle of whiskey in the bargain as well. It didn't make much difference either way—Old Virginny wouldn't have lived long enough to enjoy his riches even if he'd gotten any. In the summer of 1861, he was thrown from a bucking mustang while drunk and died from head injuries a few hours later.

But Old Virginny does have another claim to fame. According to local legend, in an earlier drunken escapade he fell down and shattered a whiskey bottle. As he watched the contents soak into the dirt, he rose to his feet and proclaimed, "I baptize this ground Virginny." And the town that grew up around and on top of the Comstock Lode was named Virginia City in his honor.

Part III of the rags-to-riches-to-rags-to-riches-to-rags story of the Comstock Lode is on page 338.

THE COMSTOCK LODE, PART III

Here's the third installment of our story of one of the biggest mining bonanzas in American history.
(Part II of the story is on page 222.)

SELLERS' REMORSE

It didn't take long for the discoverers of the Comstock Lode to realize how wrong they'd been to sell out so early. Having thousands of dollars in their pockets, perhaps for the first time in their lives, must have felt wonderful in an age in which the highest paid miners made $4 a day. In the 1850s, $1,000 had more purchasing power than $100,000 does today.

But as the new owners of the Comstock claims dug deeper into the earth, not only did the ore deposit not peter out as the discoverers had expected it would—it grew larger than the most experienced mining engineers had ever seen before. Who knows how many sleepless night were spent by the early sellouts, anguishing over what might have been had they held onto their claims for just a little longer.

WIDE LODE

Normally, such rich deposits of gold and silver are found in narrow cracks in the Earth known as *veins* or *lodes*. They're deposited there by geothermally heated water, which dissolves trace amounts of gold, silver, or other minerals at deeper levels in the Earth's crust. Then, as the water rises through cracks in the crust and gets near the earth's surface, the hot water cools and the minerals come out of suspension and are deposited in high concentrations in the cracks.

Such cracks are *usually* quite narrow—no more than a few feet wide. But not this time: by the time the miners had dug 50 feet down, the vein had grown to 10 to 12 feet wide, and as the miners dug deeper, it grew wider still. When they reached a depth of 180 feet in December 1860, the vein was more than 45 feet across—so wide, in fact, that traditional methods of reinforcing the mine

against cave-ins weren't good enough to do the job. A better technique of timbering had to be found, and in late 1860 a mining engineer named Philipp Deidesheimer found one. Instead of just putting posts against each wall and running a horizontal beam across the top to reinforce the ceiling, Deidesheimer used six-foot lengths of heavy timber to build giant cubes that could be stacked like building blocks to any height, width, or depth.

THE MONEY PIT

Once this and a few other engineering challenges were solved, the Comstock Lode began to produce valuable ore faster than the mining companies could process it. Traditional horse-powered ore processing machines called *arrastras* soon gave way to giant steam-powered mills that by the end of 1861 could process more than 1,200 *tons* of ore per day. More than $2.5 million worth of gold and silver bullion was pulled out of the mines that year; the number more than doubled to $6 million in 1862 and doubled again to more than $12.4 million in 1863.

The miners and the mine owners were making plenty of money, but in these early years nobody made out better than the lawyers. When it became evident that the Comstock Lode was one gigantic ore deposit instead of many small ones, the owners of the original mining claims wanted it all. They filed suit against newer operators to drive them out of business. By the time they succeeded in 1865, more than $10 million—the equivalent of $14 *billion* today and nearly 20% of the entire production of the mines up to that point—had been spent on lawsuits.

BOOM TOWN

As the mine roared to life, so did the city being built on top of it. In the winter of 1859, miners who'd lacked the foresight to bring their own tents with them to Virginia City had had to tunnel into the hillsides for shelter or squat in hovels made of stone, mud, and sagebrush. By the following spring, however, more than a dozen prominent stone buildings had already been built, as had dozens more of wood. Hundreds more went up before the year was out.

The presence of so many miners with money to burn and no place to burn it attracted scores of merchants and aspiring businessmen who hoped to profit by providing them with goods and

services. Soon the wagon trains hauling goods and supplies into the city stretched for miles on end. By the end of 1860, the settlement that had looked like a refugee camp just a year earlier boasted hotels, boarding houses, restaurants, butcher shops, bakeries, tailor shops, candy and cigar stores, and doctors' offices. On the seamier side, there were saloons, gambling halls, opium dens, several brothels, and at least one brewery.

That was just in the first year of growth; in the years to come Virginia City would add paved streets, gas streetlights, schoolhouses, an opera house, an orphanage, five newspapers (26-year-old Samuel Clemens began using the pen name "Mark Twain" while editor of the Virginia City Enterprise), half a dozen churches, telegraph and railroad links to the outside world, and the only elevator between Chicago and California. When a lack of drinking water became a barrier to further growth in the early 1870s, the city ran a seven-mile-long iron pipe up into the Sierra Nevada mountains and began siphoning two million gallons of fresh water into the city every day.

ON THE MAP

By the mid-1870s, Virginia City boasted nearly 30,000 residents and in many respects was the most important community between Denver and San Francisco. The wealth of the Comstock Lode remade the map of the American West and provided the impetus in 1861 to create the Nevada Territory, which became the state of Nevada just three years later. It also helped to spur interest in building America's first transcontinental railroad, which broke ground in 1863. The city of Reno, Nevada, 17 miles outside of Virginia City, was just a stop on the railroad when it was founded in 1868.

Most of the goods and supplies that went to Virginia City passed through San Francisco, giving that city a major economic boost. San Francisco's first stock exchange, founded in 1862, was set up to trade Comstock Lode shares. More prominent brick buildings were built in the city in 1861 alone than had been built in all previous years combined, and the pace of development remained high for many years to come.

Feeling unlucky that you missed out on the Comstock Lode? You might be luckier than you think.
Part IV of the story is on page 446.

THE COMSTOCK LODE, PART IV

So you think you'd like to own an interest in a gold and silver mine? Be careful what you wish for. Here's the final installment of our story. (Part III is on page 338.)

HAND OVER FIST

In all, more than $320 million worth of gold and silver ore was pulled from the Comstock Lode between 1859 and 1878, the equivalent of between $400 and 480 *billion* today. (By comparison, in 2007 Microsoft Corporation had revenues of $51 billion.) And yet for all the wealth that came out of the mines, the overwhelming majority of investors who bought stock in the mining companies over the years *lost* money in the bargain.

Part of this was due to the fact that the operating costs of the mines were staggering. The mines consumed an enormous amount of resources, including millions of pounds of mercury and other chemicals (used to extract the gold from the ore), more than 600 million board feet of timber, and another 2 million cords of firewood. Wages in Virginia City were some of the highest in the world—compensation for the remote location, the dangers of most mining jobs, and the high cost of living in a community where nearly all of the goods and supplies were brought in from hundreds or thousands of miles away.

IN THE HOLE

As the mine shafts got deeper—the deepest reached nearly ¾ of a mile down—the cost of operating the mines soared higher. At these depths, the mines were constantly at risk of flooding with scalding geothermally heated water. Giant, locomotive-sized water pumps had to be lowered into the shafts to get the water up and out of the mines; the largest of these pumps removed more than a million gallons of water per day. And yet even when the water was removed and cooler fresh air was pumped in from the surface, the temperatures at those depths remained so high that the miners

The Earth's equatorial circumference (24,901 miles)...

could only work for a few minutes at a stretch before retreating into "cooling-off rooms" to douse themselves with ice water.

THE BUBBLE BARONS

But the biggest reason for the investors' losing their shirts was the fact that the owners of the mines were more interested in manipulating stock prices than they were in running their companies responsibly. Time and again, when a fresh deposit of rich ore was discovered, the owners had it mined and processed into bullion as rapidly as possible, even at the expense of damaging the deposit and losing gold and silver through inefficient processing methods. The owners did this to generate as much hype over new discoveries as possible, causing share prices to soar in a speculative bubble.

Then, when the prices peaked, the owners would unload shares on the market and reap a fortune, and then earn even more money when the price began to drop, through a process known as *short selling*. During one run-up of prices in 1872, the share price of the Belcher mine rose from $300 to $1,575 before crashing back to $108, all in the span of eight months.

Ordinary investors often lost the most money when the mines were the most productive, as speculative mania drove prices so high that no amount of gold or silver recovered could have justified the absurd prices paid for shares. Even when the investors were lucky enough to receive dividends from their shares, many used the money to buy more stock, setting themselves up for even bigger losses when the stock tanked.

HIGH TIMES

So why did investors continue to buy shares in the mines year after year? For the same reason that people buy lottery tickets—even if most people are losing, the fortunes made by the handful of winners were so tantalizing that people gladly took the risk. Besides, money can be made in a rising stock market even if the shares aren't worth what people pay for them. So what if a $1,400 share in a mine is really only worth $140? As long as the investor can find someone willing to pay $1,500 for it, the $100 profit is just as real as if the seller had pulled $100 worth of silver and gold out of the mine. Nobody really minded that the shares weren't worth their asking prices, at least not as long as prices kept rising.

...is greater than its polar circumference (24,859 miles).

The cycles of boom and bust continued for nearly 20 years, thanks to the fact that whenever one deposit of valuable ore seemed about to peter out, a new one would be discovered and the process would repeat itself. Sixteen different major discoveries were made over the years—the last one, called the Consolidated Virginia Bonanza, was uncovered at the 1,200-foot level in 1873. At the peak of its output in 1876, the Consolidated Virginia paid out $1,080,000 in dividends per month. But the good times didn't last for long: When the Consolidated Virginia was excavated down to the 1,650-foot level in 1877, the ore suddenly ran out.

THE END?

Eighteen years and $320 million worth of silver and gold after the first discovery, no one was ready to believe that the Consolidated Virginia might be the end of the Comstock Lode—there had to be another rich deposit of ore somewhere, didn't there? Over the next decade, the mining companies spent another $40 million dollars sinking shafts as deep as 4,000 feet in search of new strikes. At first the companies paid these expenses by withholding dividends from shareholders. Then they levied "assessments" on shareholders, which were the opposite of dividends: If a shareholder wanted to hang onto his stock, he had to cough up a sum of money for every share he owned. If he refused, his shares reverted back to the company and could be sold to new investors.

The assessment system worked while new—but smaller—deposits were being found on a fairly regular basis, but as the years passed with no new discoveries, investors began to give up hope. Instead of paying their assessments, they surrendered their shares to the mining companies, who had trouble selling them even for the price of the unpaid assessments. Between 1875 and 1881, the total value of all the mining company shares on the Comstock Lode dropped from $300 million to less than $7 million.

PENNY STOCKS

By 1884 shares that had once sold for $1,500 or more were trading for a nickel apiece; even at that price, it was difficult to find buyers. By then the mining companies were so broke that they had trouble raising enough cash to operate the giant water pumps that kept the mines from flooding. One by one they were shut off, and

Worldwide, Thailand watches the most TV—an average of 22.4 hours per person [illegible]

when the last one was shut down in October 1886, the deepest levels of the lode disappeared under the water forever. Some mining companies managed to eke out small profits for another decade by mining low-grade ore close to the surface, but by 1895 even these were played out and the Comstock era came to a close.

FROM BOOMTOWN TO GHOST TOWN

As the mine went, so too went Virginia City. When the mining jobs dried up, the miners left town in search of work elsewhere, and the businesses that had served them for so many years began to close their doors. The newspapers shut down; so did the hospital, the orphanages, and eventually even the schools. As passenger and freight traffic declined to nothing, the railroads ripped up their tracks and used the steel to lay tracks to newer mining towns. Private homes that could not be sold were boarded up and abandoned. In the years to come, it became a common practice for those few residents who stayed behind to buy neighboring homes for back taxes and tear them down for the firewood.

TRADING ONE GAMBLE FOR ANOTHER

Although the Comstock Lode gave up its last high-grade ore more than 130 years ago, the riches it produced encouraged speculators to look for similar riches in other parts of the state. Many discoveries (none of them as impressive as the Comstock Lode) were made, and mining remained an important sector of the Nevada economy into the 1920s. But when the Great Depression sent both the mining and ranching sectors into steep decline, in 1931 the state of Nevada came up with another way to keep money flowing into state coffers: In 1931 they legalized gambling.

At the time, many people thought the measure would be temporary and that gambling would be outlawed again as soon as the economy improved. That wasn't the case, of course. Today Las Vegas, founded in 1905 on land auctioned by a railroad company, is one of the largest gambling destinations in the world. There are plenty of casinos in Reno, too. (And if you get tired of gambling, Virginia City, which has found new life as a tourist attraction, is only 17 miles away. It receives two million visitors a year.) So if you've ever struck it big or lost your shirt in Las Vegas, or Reno, or anyplace else in Nevada, remember: It all started with the Comstock Lode.

The late Wilt Chamberlain still holds nearly 100 NBA records.

THE (ALMOST) COLONY

From the Dustbin of History, the story of an American colony that didn't quite make it, brought to you by BRI historian and master spy Jeff Cheek.

YOU CAN'T GET THERE FROM HERE

Most American students are taught that the first two permanent English colonies in America were Jamestown, Virginia, founded in 1607, and Plymouth, Massachusetts, established in 1620. They're also taught that Jamestown and Plymouth became the nucleii of the first two of the thirteen original British colonies. Their hardy pioneers survived famine, disease, and conflicts with the Native Americans to found what eventually became the United States of America.

Few students (and possibly only the most dedicated American-history buffs) are aware that another successful colony—the Popham Colony—was established in Maine *before* Plymouth. Its demise is difficult to understand, since the colony was fairly well managed, safe, and well-supplied. The other two defied all logic by hanging on; Popham didn't. The reason? Popham's boss got a better offer.

SIR JOHN'S STOCKADE

In May 1607, as Jamestown was being settled, two ships carrying 120 colonists sailed from England, headed for Maine's Kennebec River. The *Gift of God* arrived on August 13, the *Mary and John* three days later. Leading the expedition was an aging nobleman, Governor George Popham, nephew of Sir John Popham, Lord Chief Justice of England and one of the mission's chief financiers. Second in command was a naval officer named Raleigh Gilbert (nephew of famed explorer Sir Walter Raleigh), described by historians as ambitious, brash, and arrogant—and just 25 years old.

Within two months of their arrival they had built Fort St. George, a large walled fort, inside of which were no fewer than 18 buildings, including a storehouse for supplies, a governor's house, a blacksmith's shop, and homes for colonists. Land was cleared and planted. Shipwrights even used local timber to construct a 50-foot ship called the *Virginia*—the first English-built ship in the New World. Popham was a thriving colony with a bright future.

WINTER BLUES

Many of the Popham settlers were English gentlemen who had simply come along for the adventure. When the *Gift of God* sailed back to England in December, almost half the colonists went home—a comfortable English estate was preferable to a bitter Maine winter in a stockade. But all those who remained made it through to spring...except Popham himself, who died in February 1608. Compare that to Jamestown, where more than half of the 104 settlers died before the first winter had passed.

Popham's death made Raleigh the colony's new governor...and he did a pretty good job. He used the *Virginia* to fish for cod and to map the rocky coastline, established at least some trade with the local Abenaki tribe, shipped the goods back to England (the whole point of establishing colonies), and reportedly kept the colonists in high spirits through the summer and in the face of winter's return. Then, in September, another ship arrived...and the news it brought was the death knell for Popham Colony.

POP GOES THE COLONY

Gilbert was notified that his elder brother, John, had died, leaving him an enormous estate—including a castle—in Devonshire, England. He had a choice: He could stay in Maine and develop the colony, or return home as Sir Raleigh, Lord of the Manor. He chose the latter, and the colonists, having lost two leaders in one year, had apparently had enough. They decided to go back to England, too. With that, Popham Colony was done...and was soon forgotten. If they'd held on—who knows—American students just may have been told the story of "the original 14 colonies."

Epilogue: In 1990 archaeologist Dr. Jeffrey Brain heard about Popham colony for the first time in his 40-year career. Using the only surviving document from the colony, a map showing the fort, buildings, and some coastline, he searched the Maine coast for the next seven years...and found the lost colony. Excavation is ongoing, but the remains of the fort and several buildings have been found, as well as artifacts such as glass beads, a clay pipe, nails, pottery, and armor. If you're ever up on the Maine coast—go take a look at some forgotten American history.

THE COMMANDER GUY

This marks the end of an era—our final George W. Bush quote page during his presidency. (Please lower the toilet paper to half-mast.)

"And Karen is with us—a West Texas girl, just like me!"

"My job is a decision-making job. And as a result, I make a lot of decisions."

"See, in my line of work you got to keep repeating things over and over again for the truth to sink in, to kind of catapult the propaganda."

"Reading is the basics for all learning."

"I think that the vice president is a person reflecting a half-glass-full mentality."

"It would be a mistake for the United States Senate to allow any kind of human cloning to come out of that chamber."

"As you know, my position is clear—I'm the Commander Guy."

"The public education system...is where children from all over America learn to be responsible citizens and learn to have the skills necessary to take advantage of our fantastic opportunistic society."

"I think if you know what you believe, it makes it a lot easier to answer questions. I'm not gonna answer your question."

"You know, there are all these conspiracy theories that Dick Cheney runs the country, or Karl Rove runs the country. Why aren't there any conspiracy theories that I run the country? Really ticks me off."

"I just want you to know that, when we talk about war, we're really talking about peace."

"I would still invade Iraq even if Iraq never existed."

"Well, I think if you say you're going to do something and don't do it, that's trustworthiness."

"More than two decades later, it is hard to imagine the Revolutionary War coming out any other way."

"I promise you I will listen to what has been said here, even though I wasn't here."

"It'll take time to restore chaos."

MAKING A MOVIE, PART I

One of Uncle John's secret dreams is to write, direct, produce, and star in a big-budget Hollywood movie...plus compose the music, choreograph the stunts, design the costumes, program the special effects, cook for the crew, distribute the film....Hold on there, Uncle John! You may need some help.

LIGHTS...CAMERA...ACTION!

Making a big-budget Hollywood movie takes hundreds—even *thousands*—of dedicated people. You've read their names in the closing credits of every feature film you've ever seen. But what do they all do? How does a film actually get made? This article only scratches the surface of what goes into making a movie, but you'll get a good idea of how all of these skilled people work toward the same goal...and what can happen when the goals of some don't match the goals of others. It doesn't take much to turn what could have been a good movie into a bad one, and vice versa. Yet there's one thing that all movies have in common: Whoever comes up with the idea believes it'll be a *great* one.

STAGE ONE: CONCEPT AND DEVELOPMENT

Movies usually come from one of two places: A screenwriter may pen an original story and then find a producer or director who wants to make it, or a producer may come up with the idea—possibly to adapt a book, play, TV show, or an earlier film. The producer will then work up a very rough budget and pitch the concept to a movie studio or other financial backer. If approved, the producer will then *option* the story from the screenwriter or whoever owns the rights to the story or characters. This is a contractual agreement stating that the movie rights can only be sold to that particular studio.

Next, a general outline called a *treatment* is made while a somewhat more refined budget estimate is calculated. After those are done, the studio will make a final decision as to whether or not to put up the funds to make the movie. There are more factors in play than simply whether the film will be *good* or not. These days a big-budget movie must find more ways to recoup its high cost: sequel potential, merchandising opportunities, and DVD

Marlon Brando and James Gandolfini both got their "big breaks" in movies...

sales. Studios are more likely to finance a familiar story with well-known stars that already have a proven track record, thus guaranteeing a better return on their investment. This explains why so many films are sequels or remakes. For most studios, originality is too big a risk.

If the treatment is approved, the project is *green-lighted.* At this point the film is officially *in development.* But that's no guarantee that it will get made. Snags in the process due to creative differences, budget or location disagreements, or scheduling conflicts with the director or lead actor can send the project into "development hell," a condition from which many proposed movies never recover. (See page 71.) But if all goes well, the next steps are to put together a production department and finalize a workable shooting script.

THE MODERN SCREENPLAY: MOVIE BY COMMITTEE

In recent years, the number of people who get writing credits on a single movie has grown significantly. Why? Unless a movie is written and directed by the same person, the screenplay is at the mercy of many people: a producer (often under pressure by the studio) may want to add more action or more romance to make the film more marketable, a big-name actor may demand changes to his or her character, or the director may want to put his or her own stamp on the work. In those cases, *script doctors* are called in. Here are three movies that underwent major changes from conception to release.

***CHARLIE'S ANGELS* (2000).** Based on the 1970s TV show, the screenplay reportedly went through 30 revisions and had 18 different writers. The movie didn't even have an ending when filming began. One major change: star Drew Barrymore (who also served as a producer) decided that only the bad guys would use guns; the Angels would rely solely on their martial arts skills.

Did it work? Yes and no. *Charlie's Angels* was critically panned, but the combination of three well-known female leads and a familiar premise helped the film earn over $256 million worldwide, more than recouping its $93 million budget.

***I, ROBOT* (2004).** In 1995 screenwriter Jeff Zintar wrote a *spec*

...after appearing in stage versions of *A Streetcar Named Desire.*

script called *Hardwired* about a robot who murders a man. Studio after studio optioned it and then dropped it. After spending years in development hell, the project almost died completely until 20th Century Fox obtained the rights to Isaac Asimov's classic *I, Robot* short stories. The studio commissioned Zintar to rewrite his script adopting Asimov's themes—but they *still* wouldn't approve it because it was going to cost too much to make. When Will Smith became interested in the project, everything changed. Fox agreed to a bigger budget if *I, Robot* became a "Will Smith movie." So Smith brought in his favorite screenwriter, Akiva Goldsman, to rewrite the script to match the star's on-screen persona, changing it from a "talky mystery" into an action thriller.

Did it work? Yes. Although *I, Robot* received only mediocre reviews, the combination of Will Smith + sci-fi blockbuster + summer release = a critic-proof movie. It made $345 million worldwide, more than twice its budget.

***GROUNDHOG DAY* (1993).** Danny Rubin's original screenplay about Phil Connors (Bill Murray), a bitter weatherman who finds himself living the same day over and over...and over...until he finally figures out what's really important in life, was altered significantly by director Harold Ramis. Rubin's version began with Phil already stuck in the time loop. Ramis changed it so that Phil enters the time loop *after* the film begins—and the audience has to figure it out along with him. And in Rubin's script, one of Phil's ex-girlfriends wanted to teach him a lesson so she placed a voodoo curse on him. Ramis left the cause unknown and also shortened the time Phil was stuck in the loop from thousands of years to what he estimates is "about ten years." Ramis also put more emphasis on the love story.

Did it work? Yes. Rubin was reportedly upset about the changes, but they paid off: *Groundhog Day* made $70 million domestically (it cost less than $15 million to make) and has been included on many "Top Comedies of All-time" lists.

The lesson: No screenplay is safe in the Hollywood system. Still, a working draft must be completed before the rest of the pieces can be added.

What are the rest of the pieces?
Turn to Part II on page 232.

MAKING A MOVIE, PART II: THE PRODUCERS

Now we focus our attention on the plethora of producers and their many tasks—including the most important one: divvying up the money. (Part I is on page 116.)

FROM ASSOCIATES TO EXECUTIVES

Once the shooting script is finalized, the producer begins putting together the production department. That includes producers, executive producers, associate producers, co-producers, and line producers. But what do all of these people actually *do*? Their tasks often overlap on the same project, but not only that—people with the same title on another project often have completely different duties. For this reason, the Producers Guild of America (PGA) is currently working to streamline these terms and make the duties more consistent.

• **Producer.** A movie will have several producers; the one in charge of all the others is simply called "producer." Although he or she wears many hats, the primary duties consist of staying with the film from development to release, making sure that every department has everything they need in order to complete their jobs. For a more technical definition, the PGA states: "A producer initiates, coordinates, supervises, and controls all aspects of the motion-picture production process, including creative, financial, technological, and administrative." More and more big-name directors and actors want to be producers as well, allowing them more control (but not all) over how the story will be told.

• **Executive producer.** He or she oversees all the business and legal aspects of the film—negotiating contracts, securing rights, insuring the picture, hiring the core filmmaking team, and sometimes even financing the movie. The creative work can't be started until this process is complete. On some projects, the writer/creator is given an executive producer credit, even though they didn't do a lot of work on the actual film. In other cases, the studio heads who secured rights and approved financing of a film may be given executive producer credits.

• **Associate producer.** He or she works at the producer's side, doing the legwork that the producer doesn't have time for. A mentor/student relationship often results, as most associate producers are working to become full-fledged producers themselves. This is also one of the most common "gift" credits given out as favors to stars or financiers who in reality performed no producer duties at all.

• **Co-producer.** Another confusing term, this title is often awarded for different duties depending on the project and is mostly used in television. On a big-budget film, however, a co-producer credit may be given to a team of production executives who act as liaisons between the producer and the cast and crew.

• **Line producer/unit production manager.** These two terms are often used to describe the same job, depending on the project. What they have in common is that each is the keeper of the budget. If a film is financed for $40 million, the line producer will read the script and then figure out how to divvy up the money—line by line on a 100-page budget—so that every department will have the funds to carry out their duties. After that, it becomes the unit production manager's job to tell the director that there isn't enough money for, say, shooting at an exotic location. If the director insists, the line producer will break down the budget a second time and try to free up money from other departments to fund the location shoot. Compromises such as this are the norm. For example, if the visual effects look weak, it's often because the studio had to pay the star more money than the initial budget could afford.

REEL-LIFE EXAMPLE: *SPIDER-MAN 2*

Here's a very simplified version of how the money was spent on the 2004 superhero movie, one of the most expensive—it had a $200 million budget—and highest-grossing movies of all time.

Story rights: $20 million. Marvel Comics owns the character and charged a hefty price to Sony, the studio that made the film. Marvel has since opened its own film division.

Screenplay: $10 million. *Spider-Man 2* went through many of the same kinds of story changes documented in the section on screenplays. In the end, the money was divided between the men who

created the character, Stan Lee and Steve Ditko, plus a host of other screenwriters who wrote drafts. The bulk of the money, however, went to Alvin Sargent who (along with director Sam Raimi) finalized the script and was given the sole writing credit.

Producers: $15 million. That's only the "up front" money. According to Archie Thomas, the movie writer who compiled much of this information for *The Guardian* in 2004, "including performance-related bonuses, or 'bumps' from *Spider-Man* reaching box-office targets, producer Laura Ziskin is rumored to have pocketed over $30 million. The escalating fees paid to actors are often reported, but the producers are among the richest people on the set."

Director: $10 million. Bringing in Sam Raimi to direct the first *Spider-Man* movie was a risk, as he had directed mostly low-budget horror movies, but it paid off big-time...and he was able to negotiate for a much higher salary for the sequel.

Casting: $30 million. (Tobey Maguire: $17 million, Kirsten Dunst: $7 million, Alfred Molina: $3 million, the rest of the cast: $3 million.) Negotiating these deals is often intense. Maguire—earning more than four times his salary from the first film—was reportedly fired during preproduction after showing up with a nonchalant attitude and complaining of a hurt back. When producers offered the part to Jake Gyllenhaal, Maguire's reps had to convince the producers that Maguire was indeed ready for the role and would submit to medical tests to prove it. And along with their salaries, the main stars receive such "perks" as personal assistants, trainers, chefs, first-class travel and accommodations, and anything else their clout can get them. All of the expenses so far are what's called *above-the-line*, paid to actors, writers, producers, and the director.

Production costs: $45 million. Called *below-the-line*, this is the money that goes into paying and feeding the crew, renting the equipment, fees for location shooting, and all the raw materials needed for building the sets. This is the money that the line producer/unit production manager must divvy up. (On smaller films, this is also where the most corners are cut, starting with food and housing for the crew.)

Visual effects: $65 million. Not only can this be the most expensive part of big-budget movies, it's usually the one that causes projects to go over budget. It takes an army of highly skilled programmers months to create, animate, render, and fuse the digital effects into the film. The more complex the shots, the more they cost. For example, one scene in 2007's *Spider-Man 3*—when Sandman is "born"—took three years to complete and cost nearly as much as the *entire* effects budget for *Spider-Man 2*.

Music: $5 million. Danny Elfman wrote most of the score, but after disagreements with director Sam Raimi, Christopher Young and John Debney were brought in to write additional themes. This is actually quite common. In addition to paying the composers, they had to pay an orchestra to perform the score. In addition to that, part of this budget goes to purchasing rights to songs used in the soundtrack.

Marketing and Distribution: These costs aren't usually added into the film's budget—the studios take care of this and won't disclose how much money is spent on promos and corporate tie-ins, but it's usually in the tens of millions of dollars. The cost for "prints and advertising" on *Spider-Man 2* was reportedly around $75 million.

EXTRA HELP

A recent trend is to get advertisers to pay for a share of the movie in return for product placement. The modern era of product placement began in 1982 when sales of Reese's Pieces skyrocketed after appearing in *E.T.: The Extra-Terrestrial*. A company will now pay millions if the product is displayed prominently and in a good light. There's even a new practice of tailoring the product to the country in which the movie is being shown. In *Spider-Man 2*, North American audiences saw a Dr Pepper logo behind Peter Parker when he got fired from his job; in Europe the logo was digitally replaced with Mirinda, a popular European fruit drink that's also distributed by Pepsico.

But no matter who provides the money, all of the expenses must be budgeted and divvied up before the real work on the movie can begin.

For Part III, go to page 330.

MAKING A MOVIE, PT. III: PREPRODUCTION

Wow, we've already reached the third part of this article and are only now *getting to preproduction? You see, Uncle John? Making a movie does take a lot of work. (Part II is on page 232.)*

GATHERING THE TALENT

Now that the script and budget have been approved and the director is onboard, every aspect of the project must be thoroughly planned out in advance. Every film is a "business" in its own right, so first a production company is formed. Then the director (alone or with an illustrator) turns the script into *storyboards*, rough sketches of every planned shot. Those are then sent to each department head so that they can begin the conceptualizing work, such as how the sets and costumes will appear. A rough filming schedule will also be set. Here are the people and departments who start putting it all together.

CASTING

Often a director will have specific actors in mind for the lead parts. It is the *casting director's* job to find and then begin negotiations with those actors. Alternatively, the director may give a detailed description of the roles' requirements. The CD will then advertise the parts in industry trade publications, look at hundreds or even thousands of 8x10 photos, and then schedule auditions, presenting the director with only the best candidates. The CD is usually in sole charge of casting the smaller parts and remains with the production during filming, acting as a liaison between the production company, the actors, and their agents. Sometimes, a CD must get creative to find the perfect person for a role.

Reel-Life Example: When looking for an 11-year-old boy to play the son of Daniel Plainview (Daniel Day-Lewis) in *There Will Be Blood* (2007), casting director Cassandra Kulukundis auditioned hundreds of kids from New York and Los Angeles, but they were all a little too "polished" to play a simple West Texas boy who could shoot a gun. So Director Paul Thomas Anderson sent

Kulukundis to Texas to look for the real thing. There, she found a 6th grader named Dillon Freasier who'd never acted before but otherwise had all of the desired attributes. Kulukundis recorded a screen test in Freasier's living room and sent it to Anderson, who flew out to meet the boy...and knew he was perfect "the minute he laid eyes on him." That's what directors and CDs strive for: the "Eureka!" moment when they know they've found the perfect marriage between actor and role.

Did it work? *There Will Be Blood* made nearly three times its $25 million budget during its theatrical run and went on to receive an Oscar nomination for Best Picture. And critics agreed that Freasier's performance was one of the reasons the film was so powerful.

PRODUCTION DESIGN

The *production designer* is the "architect" of the film, in charge of every object on the screen that isn't an actor. If the screenplay calls for grit and realism, the PD has to make sure that everything in the frame—from the city skyline to the tattered shoes to the trash on the ground—reflects that vision. Reporting to the PD is the *art director*, who oversees the conceptual artists to finalize the film's look. Once the main design elements are approved, a revised set of storyboards is created by the art department that will serve as a guide to setting up lighting, props, and camera angles once filming has started.

Meanwhile, the *property master*—working from an exhaustive list put together by the PD—has already begun the arduous process of finding or creating every object that appears in the movie. A *prop* is any inanimate object that an actor directly interacts with, such as a chair or a gun. A *set dressing* is any object that appears in a scene but that the actors do not touch. The property master searches through catalogs, prop houses, and thrift stores looking for these things. If they can't be found or don't exist, it is up to the art department to build them or modify them from real objects (such as turning an electric razor into a futuristic communicator).

Reel-Life Example: Jeannine Oppewall is a veteran PD with more than 30 films and four Oscar nominations to her credit, one of which was for 1998's *Pleasantville*. The film was especially difficult because it combines a period piece that strives for historical accu-

racy with a fantasy—Oppewall calls this a "hyper-reality." The plot: two modern teenagers are magically transported back to a 1950s TV sitcom town where everything appears in black-and-white and everyone behaves innocently. As the two new teenagers introduce modern values and mores, Pleasantville gradually begins to show color.

On a typical project, Oppewall will spend up to nine months working 14-hour days, researching and drawing up plans. With a period piece, she says, the most important job is taking things out: "air-conditioners, reflectors that run down the middle of the street, cars of the wrong vintage, and satellite dishes." Oppewall supervised the refurbishing of real neighborhood streets plus the creation of a replica of the town on a studio back lot.

Did it work? Yes. *Pleasantville* turned a tidy profit during its theatrical run, taking in nearly $50 million. It also garnered great reviews, most of which acknowledged how convincing the make-believe world was. In her review for the *New York Times*, Janet Maslin wrote, "The film's unsung heroine is Oppewall, who wittily turns the fantasy of Pleasantville into an actual place. Watch the sidewalks crack and the skirts grow less poufy as reality sets in."

FINDING THE LOCATIONS

After reading the script and studying the storyboards, the *location scout* or *manager* travels around to find and photograph potential places to film—a difficult job, as numerous factors must be considered before the director and producers will even go and look at it.

- How much does it cost to film there? Are there permits available? Grand Central Station may be exactly what the film calls for, but will the cost of filming there put the movie over budget?
- How noisy is the location? Nearby construction equipment or an airport can grind a production to a halt. Location scouts must be able to see into the future to know what the conditions will be like when the filming is scheduled.
- How accessible is the location? Is there power available? Only movies with the biggest budgets can afford to send an armada of trucks and helicopters out to the middle of nowhere and power it all up with generators.

If no suitable location can be found, there are options: They can "re-dress" one place to make it look like another, send a film

crew to the location to get background shots and then digitally add in the actors during postproduction, or re-create the location on a soundstage or a studio back lot.

Reel-Life Example: In the 2000 comedy *Big Momma's House*, Martin Lawrence plays an FBI agent who disguises himself as a matriarchal woman in order to catch a criminal. Production designer Craig Steams knew that "the House" would need to be a character in and of itself, so he sent four location scouts on a search through the southern United States. When the perfect house was finally chosen, producers decided that filming would be much easier in a more controllable environment. So the crew ended up building an exact replica of the house on two stages at Universal Studios.

Did it work? Yes. Martin Lawrence's performance (along with that of the house) may not have won many accolades from critics, but audiences loved it. Made for $33 million, *Big Momma's House* grossed $173 million and spawned a successful sequel.

VISUAL EFFECTS

Because shooting schedules are so tight, the *visual effects coordinator* must read the script and then tell the director what can or can't be filmed on set—and then start figuring out how to do it. There are two kinds of visual effects: those that will be completed in postproduction, and *practical effects*, which will be done on set, such as explosions, gunfire, rain, and...baby cows.

Reel-Life Example: In the 1991 film *City Slickers*, Mitch (Billy Crystal) must help deliver a newborn calf. Because an actual birthing would have been nearly impossible to set up and capture in one take, the visual effects department built an animatronic calf that Crystal "delivered" several times until director Ron Underwood was satisfied.

Did it work? Yes. *City Slickers* was a hit with both critics and audiences. If the birthing scene hadn't been convincing, the story would have suffered. Film critic Roger Ebert apparently didn't notice the ruse. "All of the subplots, like Crystal's love for a baby calf he helps deliver," he wrote, "pay off at the end."

COSTUME DESIGN

Working in conjunction with the art director, based on the PD's

vision, every single piece of clothing that the actors wear must either be found or created by the *costume designer*.

Reel-Life Example: In a character-driven film such as 2001's *Ocean's Eleven*, the costumes must help tell the story, and director Steven Soderbergh credits much of the movie's success to costume designer Jeffrey Kurland. But the head of an art department can't work in a vacuum; Kurland collaborated with production designer Phil Messina. "We share color schemes and ideas. When I told him that I was going to try to design Terry Benedict (Andy Garcia) with an Asian feeling, Phil designed Benedict's hotel with a distinctively Asian feel. We also talk about color and what he plans to use as upholstery so that the characters don't disappear into his furnishings." This is another job that begins in preproduction and stretches all the way through to the end of filming. "If I remember correctly, George (Clooney) has 26 costume changes, Brad (Pitt) has 24, Elliott (Gould) has 12 or 14. I was constantly making and designing clothes throughout the show." (In movie business lingo, a film project in production is called "the show.")

REHEARSE, REHEARSE, REHEARSE

It's important that the casting be completed as early as possible so the main actors can be brought in to rehearse and train for the various tasks their characters must perform—from stunt work to dancing to foreign accents. An actor may spend a month training for a scene that will take a week to shoot and only takes up a minute of screen time.

Reel-Life Example: When Keanu Reeves, Carrie-Anne Moss, Laurence Fishburne, and Hugo Weaving were cast as the four leads in 1999's futuristic action film, *The Matrix*, they figured training would only last a few weeks. Instead, it took closer to *four months*. Under the tutelage of kung fu choreographer Woo Ping Yuen, they had to learn not only martial arts but how to fight each other while suspended on wires.

Did it work? Yes. *The Matrix* set a new standard for action movies with both its never-before-seen visual effects and complex fight scenes. But it wasn't easy—the film spent four years in development and over a year in preproduction before the first scene was even filmed.

For Part IV, go to page 433.

MAKING A MOVIE, PT. IV: PHOTOGRAPHY

Our big-budget motion picture is finally ready to begin filming. Here are but a few of the hundreds of people who make it happen. (Part III is on page 330.)

THE VISUAL STORYTELLERS

Filming is actually the quickest aspect of movie-making, usually taking only one to three months of the entire process. Adhering to a strict schedule of "get the shot done and move on to the next," the filmmakers assemble the many pieces that will be put together and cleaned up in postproduction. Yet many successful movies—ones that appeal to both viewers *and* critics—will report having had a close-knit crew. The actors say that this production was "different" and "special." Everyone talks about how much fun it was to shoot. Well, for that to happen, it all starts with the single most important person on any movie set.

THE DIRECTOR

Responsible for the tone, pacing, and overall vision of the film, the director has the job of taking what's in the script and translating it to the screen. While his or her primary duty is assisting the actors in their delivery of lines, the director is also usually the last person to sign off on every aspect of the production, from preproduction to the final sound mix. In many cases, especially within the studio system, the producer or the studio can usurp the director's power in an attempt to make the finished product more marketable and more appealing to a mass audience, which is why many experienced directors prefer to take on the producing duties as well. Still, it is the director—not the producers—whom the actors and crew rely on to keep them all on the same page.

DIRECTOR OF PHOTOGRAPHY

Often the director's closest collaborator, the DP is responsible for the film's composition (how everything appears in the frame), its color palette, and how light or dark each scene is. Some directors are very specific about how they want the film to look, meaning

that the DP simply executes their orders, while other directors are more focused on the acting and give the DP creative license. Either way, DPs are in charge of making sure that the cameras, lenses, and film stock are available and in working order, and see to it that the film is processed after every scene so that the director can review the *dailies*. (Two terms that are often intertwined are the director of photography and the *cinematographer*. If both are listed in a movie's credits, it is usually the DP who oversees the camera crew and the cinematographer who is in charge of the composition and camera moves for each shot.)

Reel-Life Example: Wanting their 2000 comedy, *O Brother, Where Art Thou?*, to look like a "fable," directors Joel and Ethan Coen charged DP Roger Deakins with the task of creating a sepia-toned look, complete with yellow trees and amber skies. One big problem: they were filming in Mississippi during the summer, when the trees were green and the skies blue. After trying various photo-chemical processes—including bleaching the film—Deakins realized that the look couldn't be achieved through conventional means. Result: *O Brother* marked the first time that an entire film was digitally colored. The process took two months to complete.

Did it work? Yes. Critics and audiences loved the quirky film; Deakins was nominated for an Oscar. More praise: Robert Allen of the International Cinematographers Guild wrote that "historians will look back on *O Brother, Where Art Thou?* as a milestone."

MIDDLE MANAGEMENT

Movie sets are chaotic—hundreds of workers, each in charge of a specific task, work on different scenes simultaneously, often out of sequence, most not even aware of the storyline. Here are those whose job it is to keep the chaos in order.

• **Assistant Director.** If you were to visit a movie set, you might mistake the AD for the director—they're usually the loudest, barking orders and yelling "roll" and "cut" while the director sits quietly in a chair looking at a monitor. That's the AD's job—to let the director stay focused on the story being told. The AD must always stay one step ahead, so when the time comes for the cameras to roll, everyone and everything is ready to go. The AD sets the day's schedule and prepares *call sheets*, a list of which actors are needed for the scenes being shot. In addition, the AD relays instructions

from the director to the other department heads, including the *1st AD* and *2nd AD*, who do the same thing for the AD that the AD does for the director. Their most important job is setting up and directing the extras.

• **Production Coordinator.** Responsible for maintaining the schedule and making sure the cast and crew are fed and have accommodations while on location.

• **Location Manager.** When a huge film crew takes over a location such as a small town, a city street, or a tourist attraction, the location manager obtains all required permits, heads up the security department, and keeps the locals happy. (On some productions, the location scout stays on as the location manager; on others a separate person is hired.)

• **Script Supervisor.** Responsible for *continuity*, the script supervisor views every single take of a scene—which can begin on location and continue weeks later on a soundstage—to ensure that the lighting, props, hair, makeup, and costumes don't change drastically between takes. The script supervisor also notes when what's been filmed differs from what's in the script.

• **Costume Supervisor.** In charge of the *costumers*, who see to it that the actors' clothes are always in the desired condition. This sometimes requires "aging" a new garment so it looks worn in. Along with the *hairstylist* and *makeup supervisor*, the costumers are in nearly constant contact with the actors—from seconds before the cameras roll to seconds after they cut. On special effects films that require prosthetics, this can be a very large department with many skilled craftspeople working around the clock.

• **Production Assistant.** Basically, they're gofers, ready to do anything that needs to be done. They may run a broken doorknob back to the prop department, or make sure the producer gets his half-decaf double latté with two sugars and no foam. On big-budget movies, each of the principal cast and crew members gets their own PA.

THE TECHNICAL CREW

This group must work together as if they are a single person, because it only takes one little goof to cause the entire scene to be re-set (extras and all) and the shot done over.

• **Clapper-loader.** Loads the film stock into the camera and also

claps the *slate* (or *clapboard*) before each take (on larger productions, separate people are hired for these jobs). The original use of the slate was to sync up the audio and visual for editing, but with digital technology this is no longer necessary. Still, the slate remains, mostly as tradition, but it does contain necessary information—the scene and take numbers and the date and time.

• **Camera Operator.** Whether following the action on foot with a steady-cam or perched up in a crane zooming out for a wide shot, the camera operator must have not only extensive technical knowledge of the cameras and lenses but a creative eye as well. Larger productions have multiple camera operators.

• **Focus Puller.** Because a movie is designed to be projected on a very large screen, it is essential that the lenses are focused perfectly. The focus puller sits beside the camera and adjusts the focus, based on predetermined calculations. Along with the AD, they arrive on set early to rehearse the upcoming scene, or *block* it, with stand-ins to determine focus and camera movements.

• **Grips.** Led by the *key grip* and including the *dolly grips*, this crew of strong backs is in charge of setting up and breaking down all of the production equipment, including the cameras, cranes, and *dollies* (small train tracks for shots that require the camera to follow the action). Grips also set up the lighting system, which includes the lights, huge diffusers and reflectors, and heavy fabric used to *tent out* windows to keep out extraneous light.

• **Gaffers.** Working closely with the grips, the gaffers are the on-set electricians. They make sure that the lighting systems, cameras, dollies, cranes, fans, rain and wind machines, and video playback monitors are all wired correctly. Because of the enormous amount of power needed to run the equipment, gaffers must be experts, making sure that no fuses blow, which would delay production.

• **Best Boy.** This can be either gender and is divided into two categories: *best boy grip* and *best boy electric*, working as an assistant to the key grip and gaffer, respectively. Larger productions have multiple best boys. Their duties are often determined by what's needed at any given time, be it unloading equipment from a truck or finding a larger fan because the director wants even *more* wind.

• **Location Mixer.** Although very few sounds (footsteps, breaking glass, traffic, etc.) recorded on set in modern feature films ever make it to the final cut, most of the dialogue does: It must be recorded

Éclair means "lightning" in French.

clearly so that the editors, sound designers, and actors can reference them later in postproduction. The *boom operators* stand just outside of the shooting area holding long microphones over the top of the action while the location mixer monitors the scene with headphones.

• **Second Unit Director.** The *second* unit films any shot in which the principal actors are not needed, such as a close-up of an object, an explosion, crowds, or background scenery. On a larger production, third and even fourth units may be necessary.

• **Leadman.** In charge of the *swing gang*, the construction crew that builds and breaks down the sets. Next come the *set dressers* to add in objects such as furniture and wallpaper, as well as matte paintings (photorealistic murals used to convey distant locations) and green screens (monochrome curtains that will be replaced digitally in postproduction). The swing gang is already gone and working on the next set when the crew arrives to film.

• **Stunt Coordinator.** Not only choreographs the stunt performers for any shot deemed too dangerous for the actors, but must ensure the safety of the actors when they insist on doing their own stunts.

• **Wranglers.** In charge of any nonhuman performers.

• **Still Photographer.** Takes pictures for various purposes: framed photographs that will end up in the movie, promotional photos for advertising, as well as reference pics to aid in continuity.

• **Caterers.** Provide all of the meals for a legion of hungry people.

• **Transportation Coordinator.** In charge of getting the principal actors to and from the set each day as well as assembling a convoy of semitrucks—and sometimes airplanes—to transport the equipment to the location.

For Part V, go to page 531.

* * *

Reel-Life Wrangling Example: On the set of *The Shawshank Redemption* (1994), animal trainer Scott Hart set up a shot in which Brooks (James Whitmore) feeds a maggot to his pet crow. Per requirement, a Humane Society representative monitored the shoot to see that no animals were harmed—and deemed the scene "cruel" to the maggot. The only solution: They had to wait for the maggot to die of "natural causes" before the shot could be filmed.

"Talk is overrated as a means of settling disputes." —Tom Cruise

MAKING A MOVIE, PT. V: POSTPRODUCTION

Good news, Uncle John: Principal photography has been completed! Bad news: Your movie is only half-done. (Part IV is on page 433.)

SHIFTING GEARS

Once filming has wrapped, the number of people working on a movie shrinks from a few hundred to a few dozen. And the workplace shifts from huge soundstages and grand locations to small rooms with computers and video screens. While much of the postproduction work actually begins while the movie is still filming (such as visual effects), most of it isn't completed until a month or two before the movie's release. (That's why movie trailers often have different music, different visual effects, or even different scenes than the final film.)

In charge of the process is the *postproduction supervisor*, who maintains the schedule, hires vendors, brings the actors back if necessary, and keeps the distribution and marketing departments informed of the progress. That way, the director and producer can spend their time looking over the editor's shoulder.

EDITING

Without a highly skilled editor fitting all of the pieces together into a well-paced narrative, the movie wouldn't work. The editor's first task: create an *assembly cut* of the film—nearly every single take from every single scene, put into order according to the script. The director then spends a few days viewing it over and over, marking the best takes for the editor. With that information, the editor makes a *rough cut*. The director then watches *that*, looking for three main things: the order in which the scenes occur, how the shots are cut together within each scene, and which scenes didn't work as planned. With a new set of notes, the editor cuts the movie yet again. This fine-tuning keeps going until everyone is satisfied.

It's said that a good editor will "discover the film" in the cutting room, putting emphasis on an aspect of the movie that the director may not have seen as that important.

Reel-Life Example: The first rough cut of the original *Star Wars* presented to writer/director George Lucas in late 1976 was a mess. The pacing was slow; some shots lingered too long and others ended too quickly. With the film already behind schedule, Lucas fired his editor and brought in three new ones: Paul Hirsch, Richard Chew, and his own wife, Marcia Lucas. One such quick cut was when one of the sandpeople attacked Luke (Mark Hamill) with a staff. At the end of the original shot, the creature raised his staff above his head and then the shot ended abruptly. Hirsch extended the scene by running the film backwards for a brief second just as the creature's arms reached their highest point, then repeated that up-and-down move four times, adding emotional impact.

Did it work? Yes. Lucas has since credited the editing as one of the main reasons for the unparalleled success of *Star Wars*.

ADDITIONAL PHOTOGRAPHY

Why do so many movies have a "typical Hollywood ending?" After the rough cut of the film is finished, the studio will show it to test audiences and focus groups who then answer a series of questions: "Did you understand the plot?" "Did you like the ending?" If the majority of viewers answer "no," the studio will mandate a new ending (often a happier one) and bring the principal actors back in for additional photography, sometimes called *pickups* or *re-shoots*. New sets often have to be built, because movie sets are designed to last only the few days they're needed and are then destroyed.

Another reason for additional photography: Sometimes the director or producer feels something is missing—perhaps a reaction shot that further explains a character's motivation. According to screenwriter John August (*Big Fish*), "In most cases, it's not that you're adding something great, but rather that you're replacing something sucky."

Reel-Life Example: The 2007 horror thriller *The Invasion*, a remake of the classic sci-fi film, *Invasion of the Body Snatchers*, was German director Oliver Hirschbiegel's first English language film. Test audiences (and Warner Bros. execs) found the film too "claustrophobic" and "moody," so producer Joel Silver took the extreme step of bringing in a new director to reshoot much of the film. In fact, he brought in *three* directors—Larry and Andy Wachowski, directors of *The Matrix* trilogy, and their longtime collaborator,

James McTeigue—to redo all the action scenes and the ending.

Did it work? No. After arriving in theaters a year and a half after its original announced release date, *The Invasion* was lambasted by critics and bombed at the Box Office.

AUTOMATIC DIALOGUE REPLACEMENT (ADR)

ADR, or lip-synching—also called *looping*—occurs months after filming has wrapped. Although the director would love it if every bit of dialogue recorded during filming was usable, much of it is not—either due to low audible levels, extraneous noises, or performances that didn't quite hit the mark. In addition, naughty words need to be changed so the film can be shown on broadcast television, or if the studio just wants a more family-friendly rating.

Reel-Life Example: In the 1999 comedy *Galaxy Quest*, when Gwen (Sigourney Weaver) sees the "Chompers" that she must run through, the audience hears her say, "Well, screw that!" but her lips are obviously saying...something else.

Did it work? Yes. After the original cut was deemed "too dark," much of the violence and language was toned down in postproduction, making *Galaxy Quest* more accessible to a younger audience that helped it earn more than twice its $45 million budget.

VISUAL EFFECTS

Working against tight deadlines, digital effects artists pore over every layer of every frame, striving to combine digital and traditional shots, often "painting" out green screens and adding in background plates (such as a fake sky)...hoping that the director will approve of their completed shot.

Reel-Life Example: One of the most effects-heavy movies ever made was 2003's *The Return of the King*, the conclusion to the *Lord of the Rings* trilogy. One particularly complex shot featured two giant, elephantlike creatures (called *mûmaks*) crashing into each other, and then tumbling to the ground. After working on the shot for six months, the digital artists were disheartened when director Peter Jackson informed them that it lacked the size, force, and impact that he was looking for. But time was running out—they only had *two days* to redo it. Working nonstop, the effects team was able to match up with Jackson's vision.

Did it work? Yes. Jackson's insistence on perfection in every

aspect of the filmmaking process was rewarded with massive commercial *and* critical success, culminating with eleven Academy Awards, including the Oscar for Best Visual Effects.

SOUND DESIGN

Every scene of a big-budget movie contains dozens of separate and distinct sounds: squeaky floor boards, slamming doors, barking dogs, cars, thunder, coughs, sneezes, crashes, explosions, and so on. Each must either be found or created in post-production. The *sound designer* will first search through vast sound effects libraries (which explains why you've heard the exact same hawk screech in so many movies). What can't be found must be created by *Foley artists*—named after influential Hollywood sound effects man Jack Foley. Working in either a soundproof room or outdoors if required, these technicians pull from a giant bag of tricks.

Reel-Life Example: For the 2008 animated comedy *WALL-E*, in which a discarded robot must save humanity, producer Jim Morris brought in veteran sound designer Ben Burtt, who first made his mark on the *Star Wars* films. Since WALL-E must communicate without words, Burtt used the same technique he used 32 years earlier for R2-D2: he recorded his own voice making kid sounds and then ran those through a synthesizer.

Did it work? Yes. Because the speechless robot was given a human foundation for his vocal utterances, audiences were able to identify with his plight, helping *WALL-E* to become a huge summer hit.

MUSIC

Music is divided into three categories: The *soundtrack* consists of songs played over the top of the scene that help convey mood. These are found by the *music supervisor*, working from a director's wish list. This process is usually started before postproduction begins, as negotiating payments and securing rights can be a lengthy process. The second category is *source music*, sometimes called *incidental music*. This may be the background music played at a restaurant or a carnival ride at a fair. Rights have to be secured for incidental music as well, unless it's in the public domain. The third category is the *score*, original music that a composer creates specifically for the film.

In most cases, the composer isn't brought in until well into

The paper bucket used for chicken by KFC was created by Wendy's founder Dave Thom

postproduction. Once on board, he or she will watch the most recent edit of the film—often accompanied by a *temp track* of pre-existing music to help convey what the director is looking for. Then it's up to the composer to write the music, and for the music supervisor to hire an orchestra and book studio time to record it. This is also an area where creative differences often occur.

Reel-Life Example: In 1989 Hans Zimmer was hired to score Ridley Scott's action movie, *Black Rain*, starring Michael Douglas as an American cop caught up in the Japanese underworld. Zimmer tried to bring something new to the typical action score by blending in traditional Japanese music. He recalls that producer Stanley Jaffe "hated the score so much that I actually got shouted at after a screening, and I fainted. By the time we got to the dub stage, I was just living in fear. And it's odd because after the Oscars, I went to a private party. Michael Douglas was there, and he said, 'You really saved my a** in *Black Rain*.'"

Did it work? It appears Douglas was right; the movie earned $134 million in worldwide ticket sales. And Zimmer boasts that his ethnically flavored music has had a lasting influence. "*Black Rain* had somehow set up a new way action movies could be scored. Soon everybody was doing the *Black Rain* thing."

TITLE SEQUENCES

Some filmmakers still open their movies with elaborate title sequences. A great deal of work is put into these stand-alone "short films" that, according to Saul Bass, the man who pioneered them in the 1960s, "should create a climate for the story that's about to unfold." The process: The script or the most current cut of the film is sent to a title design company along with the list of credits, a music temp track if one is available, and any instructions concerning the style (animation, computer graphics, and so on). After the designers watch the film, they draw up *style frames* of what the sequence will look like. Once the director approves those, they complete a rough draft of the entire sequence. And it goes back and forth until the director is happy; then the music is mixed in, and the title is ready to go.

Reel-Life Example: Four of the five 2007 Best Picture nominees used a "cold" opening (no title sequence at the beginning). The only one that used a traditional opening title sequence was Jason

Each eye of a dragonfly has about 30,000 lenses.

Reitman's *Juno*, a comedy starring Ellen Page as a teenager dealing with pregnancy. Reitman hired a small company called Shadowplay to do the sequence, and the process was a bit different than most feature films. Before animating the entire sequence, Gareth Smith, co-founder of Shadowplay, sent style frames—inspired by vintage 1970s punk-rock posters—to Reitman for approval. After that, hundreds of photographs were taken of Page walking on a treadmill carrying a bottle of orange juice. Those were then cut out and hand-animated to create the retro feel. Adding to the whimsy of the sequence was the song, "All I Want Is You," by Barry Louis Polisar, which Reitman had chosen himself. "Title sequences tend to be an afterthought for most films," says Smith. "We prefer to develop ideas early in the filmmaking process, which we think enhances the storytelling of the film."

Did it work? Yes. *Juno* cost $7.5 million and grossed over $228 million worldwide, making it one of the most profitable films of all time...and making Shadowplay a not-so-small company anymore.

PUTTING IT ALL TOGETHER

As the release date looms ever closer, the work intensifies.

- **The final sound mix.** This is the last step in the creative process. Any given shot in a film may contain dozens of sounds. For instance, a bar fight will contain the actors' voices, source music, score music, sound effects of punches landing, windows being broken, and what's known in the industry as *walla* (background murmur noise). Every single one of these sounds needs to be carefully balanced by the sound editor.
- **Locking the picture.** Most of the postproduction tasks have been going on simultaneously, with the director running from one office to another, looking and listening, and signing off on things. But at some point, the work must stop, and that's not often when the filmmakers would prefer. As director Peter Jackson once said, "You never really finish a film; you just keep working on it until they tell you to turn it in." (Just like making a *Bathroom Reader*.)
- **Making prints.** The finished film must be copied up to 2,500 times for distribution to theaters all over the world. This is a highly technical process that takes place in specialized labs. Because making thousands of copies would wear down the master, a series of intermediate prints must be made to copy from: first is the *interpositive*, a low-contrast copy on very fine-grained film stock. From this new master, a set of *internegatives* are made. These contain the separate audio tracks; some will also be given subtitle tracks for foreign markets. The final step is to create the individual copies, which are divided into reels, each holding 2,000 feet of film (on what is technically called a *double reel*). A typical film will comprise five separate reels. Now they're all ready to be sent to theaters—bigger movies will be given fake labels in an effort to curb piracy. Often the final reel won't be sent until the day before the film opens.

MARKETING AND DISTRIBUTION

A separate company, hired by the studio, has been working for months on ways to get the movie shown in as many theaters and to get as much buzz among filmgoers as possible. They negotiate with distributors, film festival organizers, as well as marketing companies that will help promote the film. They send the finished film to *exhibitors*—theater owners who pay for the right to show it and then share in its profits. The latest trend is *viral marketing*, mainly done on the Internet. This consists of getting online users involved in the process while the film is being made, relying on word of mouth to increase the buzz. The more faith a studio has in a film, the more money it's willing to spend to advertise it.

LETTING IT GO

The release date finally arrives. Commercials have been airing; press kits and posters are displayed in theaters; and the stars have promoted the movie on talk shows. Now, the film is completely out of the filmmakers' hands—it is up to the movie-going public to decide whether or not they've succeeded.

But the odds are not in the filmmakers' favor: Out of the roughly 600 movies that get released into U.S. theaters each year (about 2/3 of those are independently made)—only a select few will turn a profit. And less than one percent will become classics. For that to happen, the concept needs to be fresh, the story needs to be well written, the film needs to be well shot, well acted, and well edited; and the timing in the marketplace needs to be right. A misfire in any of these areas results in yet another one of the thousands of movies that you see sitting there see on the video shelf...but never seem to be able to bring yourself to rent.