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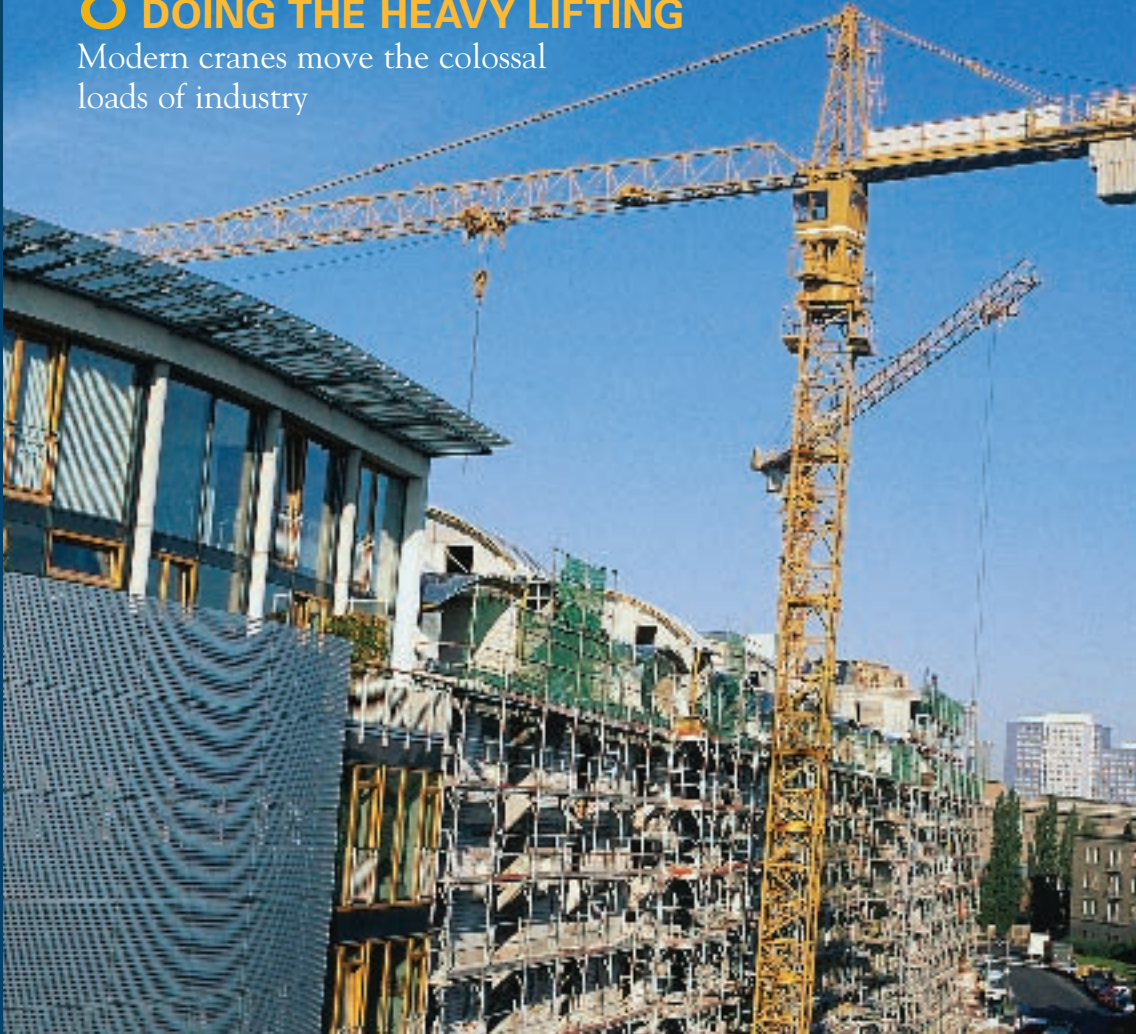
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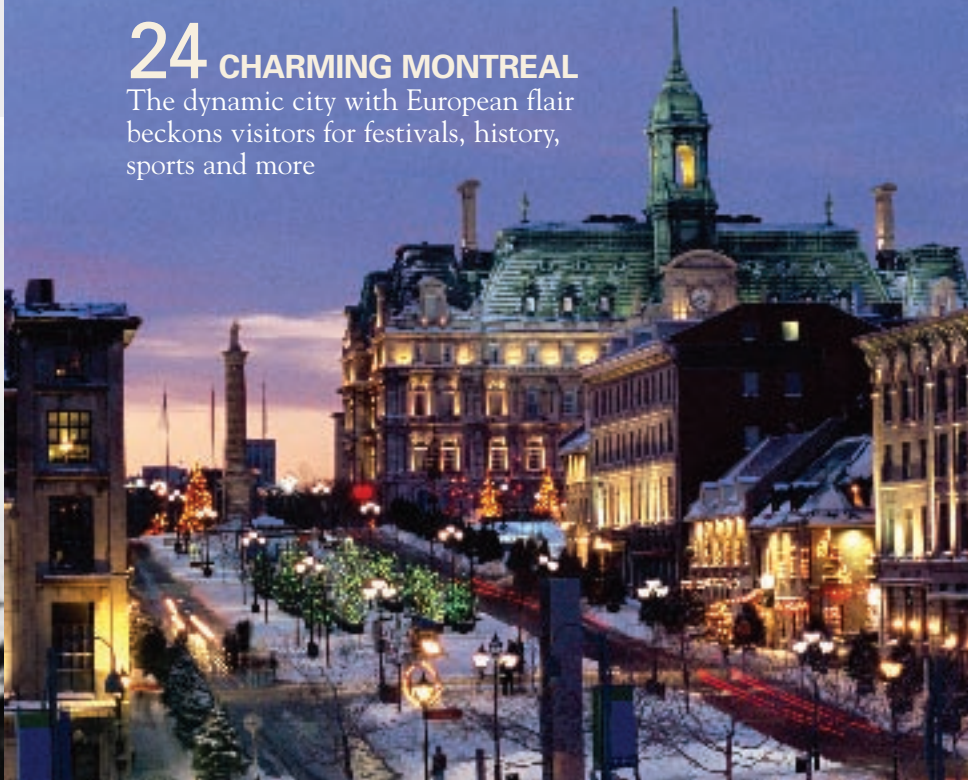
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General Douglas MacArthur's speech has inspired for more than 40 years



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The dynamic city with European flair beckons visitors for festivals, history, sports and more



Quality Service in Uncertain Times



Dixon, like the rest of the country, is looking at the 2009 global economy with a lot of uncertainty and questions. Many banks, insurance companies and investment houses have been bailed out, sold or have gone out of business. The rest of us, the ones footing the bill, are going to have to make it on our own during this economic downturn and tight credit market.

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The True Meaning of Our Lives

BY MICHAEL JOSEPHSON

I saw a cartoon of an old king checking in at the gates of heaven. The gatekeeper, with a large book in front of him, said, "Edward the Good, huh? Well, Eddie, we will be the judge of that." The point is that, in the end, generous self-appraisals won't matter. Our epitaphs will be written and eulogies delivered by the people who knew how we lived. The real meaning of our lives may be defined by how we are remembered.

When a Swedish newspaper printed Alfred Nobel's obituary by mistake, he had the rare opportunity to see how others saw him. It changed his life dramatically. Though the article was complimentary, describing Mr. Nobel as a brilliant chemist who made a great fortune as the inventor of dynamite, he was horrified to be memorialized in such materialistic terms. Determined to leave a more positive legacy, he bequeathed his considerable wealth to the

establishment of the Nobel Prizes to acknowledge great human achievements. Few of us can create something as momentous as the Nobel Prizes, but we can all live lives that earn a eulogy our children and parents would be proud of.

In the hurly-burly of everyday living, it's hard to keep perspective. Money, position, pride and power seem so important—until they're not. At the end of their lives, no one says, "I wish I spent more time at the office." It's a matter of priorities.

So if you want to know how to live your life, just think about what you want people to say about you after you die and live backward. ■

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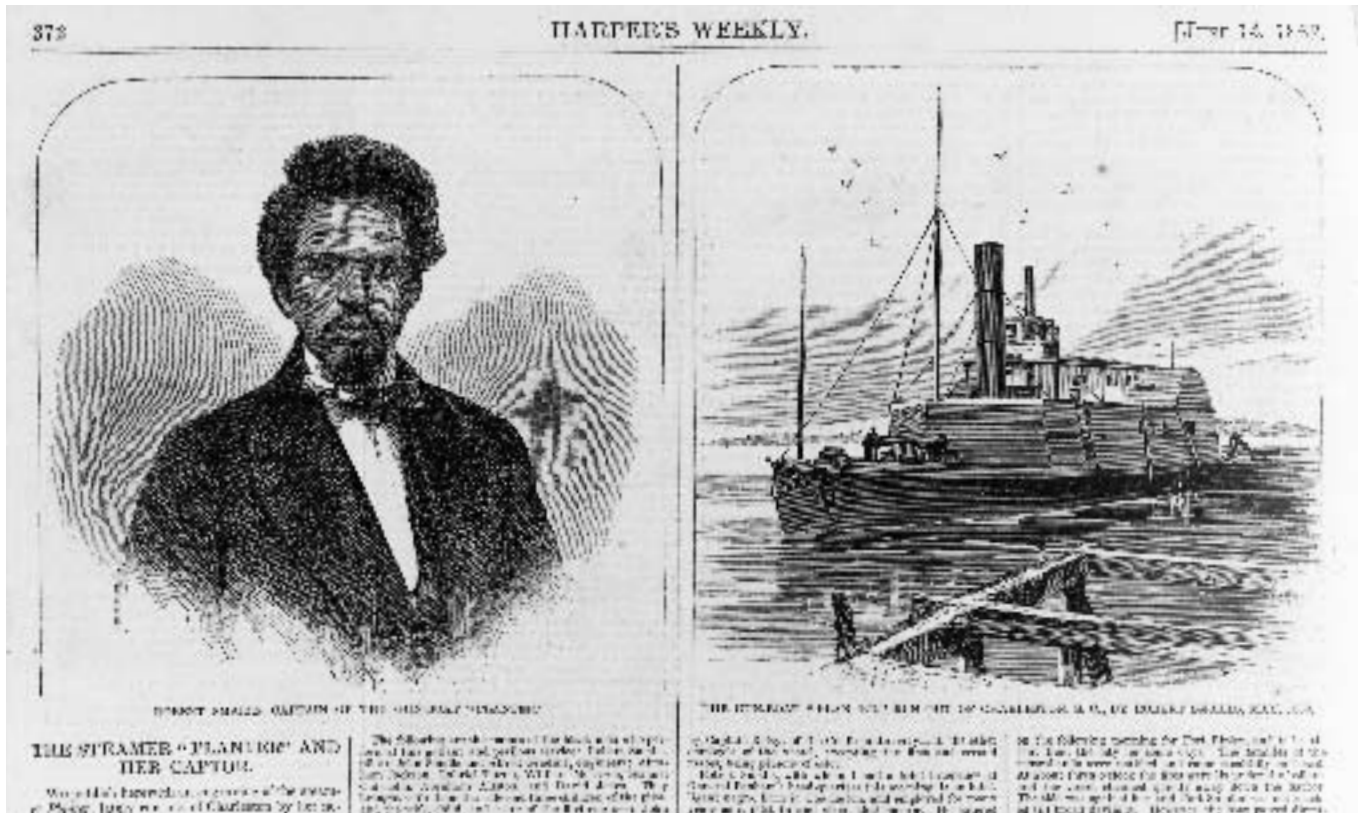
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The Civil War-era periodical *Harper's Weekly* highlighted the bravery of South Carolina slave Robert Smalls and his crew as they commandeered the *Planter* to gain their freedom.

An Equal Chance in the Battle of Life

Born a slave, Robert Smalls persevered to become a decorated veteran and U.S. congressman

BY SARAH ACHENBACH

As darkness fell on South Carolina's Charleston Harbor on May 13, 1862, Robert Smalls' chance for freedom had finally arrived. The white Confederate officers of the transport steamer *Planter* had gone ashore to attend a party. Smalls, the *Planter's* quartermaster or wheelman, and the other black crew members quickly put their plan in motion. Their family members, including Smalls' wife, left their hiding places in other vessels and crept aboard.

Smalls, the son of a white man and a Beaufort, S.C., house slave, donned the Confederate captain's clothing and expertly piloted the steamship past Fort Sumter to the Union blockade. He knew the waters well. Before gaining employment on the *Planter* a year earlier, he had spent a decade on the Charleston docks as a sailmaker and rigger—his owner sent him there when Smalls was 12 to work for hire.

The *USS Onward*, the first vessel in the blockade, prepared to fire. Smalls raised a white flag, and in exchange for his freedom and that of the dozen slaves on board, he surrendered the *Planter* with its prized artillery of a howitzer, pivot gun, rifle and four cannons. Dubbed "the first trophy from Fort Sumter"—and with its firearms, shallow draft and capacity to carry 1,000 passengers, it was, indeed, a prize—Smalls and his crew were hailed as heroes. They received a cash prize, as was the custom for the surrender of an enemy ship, but because they were former slaves and considered contraband under the Dred Scott Decision, it took a congressional bill signed by President Lincoln to award the prize.

During the Civil War and for the rest of his days, Smalls proved himself as a leader of equal weight on land as on sea. He met with Secretary of War Edwin Stanton and

President Lincoln to request the recruitment of 5,000 African-American soldiers to create the U.S. Colored Troops, though he himself would never receive a commission in the troops. (He was employed by both the U.S. Army and Navy, though he was never commissioned by either service branch.)

In 1863, he was detailed to the ironclad *Keokuk* and survived an ill-fated Union attack in the Charleston Harbor that sank the *Keokuk* moments after the crew was rescued. Several months later, he returned to the *Planter*, where his courage, once again, prevailed. During a battle, the steamer's white captain signaled to surrender. Knowing full well the harsh treatment he would receive if captured by the Confederacy, Smalls commanded the gunners to continue to fire. While the captain cowered in the coal bin, Smalls led the crew in a heroic—and victorious—battle. The captain was dismissed and Smalls was named captain of the *Planter*, becoming the first black man to be named captain of a vessel in U.S. service.

After learning to read and write, Smalls attended the 1864 Republican Party Convention as part of a delegation of free blacks, which set the course for his political career. He served as a South Carolina state legislator from 1868 to 1870, and in 1875, he was elected to the first of his five terms as a U.S. congressman. Smalls' progressive agenda helped to define equality for African-Americans, fighting

for equal travel accommodations and for the civil and legal protection of multiracial children. Smalls' leadership of his home state was far-reaching, as well. His legislation created South Carolina's public school system, the first such educational system in the United States, and he helped to draft South Carolina's constitution and founded its Republican Party.

Smalls resigned from office in 1887, and for nearly 20 years served as the U.S. Collector of Customs in Beaufort, living in the house where he was born a slave. He also served as a major general in the South Carolina militia, though his lifelong petition to collect a pension for his military service was unsuccessful.

Smalls, who died in 1916, constantly struggled against racial barriers, but his tenacity and belief in liberty and justice for all created a better life for white and black citizens alike. He once wrote, "My race needs no special defense, for the past history of them in this country proves them to be equal of any people anywhere. All they need is an equal chance in the battle of life." In 2004, the U.S. Army commissioned its first Army Reserve vessel named for an African-American: U.S. Army Maj. Gen. Robert Smalls (Logistics Support Vessel-8), a fitting tribute to a man who found his freedom and fortitude—and helped to change this country—on a similar working vessel nearly 150 years ago. ●

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DOING THE HEAVY LIFTING

How modern cranes make the lifting of colossal construction loads possible By Virginia Hughes

"Graceful" may be the last word you'd think of to describe the elements of a typical building construction site: jagged chunks of raw material; piercing noises; flying debris; rough-and-gruff construction workers. Perhaps the one exception—poised well above the fray, like the bird that shares its name—is the crane.

Hundreds of thousands of construction cranes are used throughout the world—for assembling heavy manufacturing equipment, for unloading freight from cargo ships and, of course, for building.



A replica of a crane originally built by the Romans, noted for their innovative engineering achievements, now stands in Bonn, Germany, above.

Tower cranes are used to transport heavy loads to the top of ever-rising construction projects. Below, a crane lowers rebar as construction workers guide it into position.

Major cities are prime nesting grounds for many of the world's construction cranes. More than 125,000 tower cranes are in operation throughout the world, and industry experts cautiously estimate that 15 to 25 percent of them are in use in the city of Dubai, according to a report from the organizers of the Conmex construction machinery exhibition and *Gulf News*. New York City's Buildings Department estimates that 175 tower and mobile cranes are in use there on any given day.

But, the same is true for less populated regions. "It's not unusual to go into a small crane rental company and see 30 to 40 cranes that they rent to just that local area," says Matt Burkart, a civil engineer and president of Aegis, Corp., an engineering consulting firm in Southampton, Pa.

"Even on small sites, three- to four-story buildings, cranes are used quite frequently," he says. "And you can't build a high-rise without a tower crane."

The world's largest cranes can lift as much as 19 tons (38,000 pounds). But that's not, by any means, an upper limit. "If you need something bigger, you can make it,"



says Richard Smailes, professor of building construction at the University of Florida. "It's not a complicated process. It's all just a matter of leverage."

HISTORY

Crane design and operation is not a rapidly changing technology. "You're looking at an ancient technology that hasn't changed in thousands of years," says Smailes. "The physics involved in lifting something hasn't changed, nor has the way we've gone about it."

Historians trace crane technology to the ancient Greek civilization, as far back as the sixth century B.C. Before that, the large, unskilled labor force that constructed buildings pulled objects vertically using ramps. (It takes less effort to pull an object upward on a ramp, or inclined plane, than lifting it straight up, though you must pull it a greater distance.)

But starting around 515 B.C., the Greeks replaced ramps with wooden pulleys—wheels with a grooved circumference—allowing one person to lift loads up to several hundred pounds.

A pulley system works like this: A rope attaches to a heavy load at one end, and then wraps around several pulleys. The wrapping gives "mechanical advantage," allowing someone at the other end of the rope to lift the load with much less effort. The Greeks used men or donkeys to pull the ropes through simple pulley systems.

The Romans lifted much larger loads—up to 6,500 pounds per person—using treadwheels, in which two men would walk inside of a giant wooden wheel. "As they're walking, they're turning an axle attached to the wheel, and a rope starts winding around the axle," Smailes explains. The rope, then looped through several pulleys, would be pulling a heavy load at the other end. "Now we have a diesel engine to do it, but back then they essentially put two guys in a hamster cage," he says.

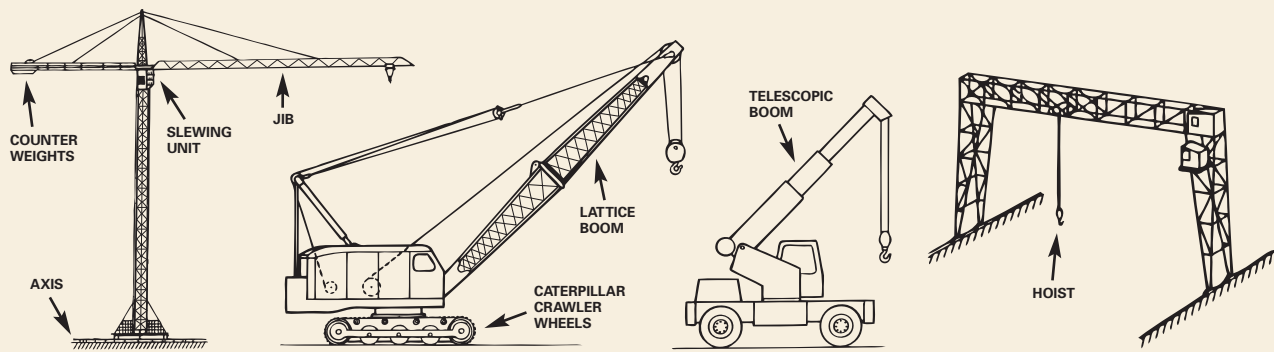
A thousand years later, medieval architects also used treadmills attached to wooden cranes to lift the heavy stone and glass pieces that made the enormous European cathedrals.

Historians think that stationary harbor cranes—those that are fixed permanently on a dock and then pivot to move freight on and off a ship—were developed in the Middle Ages.

In the 18th century, cranes were powered with the newly developed steam engine. At the turn of the 19th century, the Industrial Revolution brought the mass production of steel, making cranes much stronger and larger than the previous wood versions.

MECHANICS OF TOWER CRANES

The steel revolution also led to the development of tower cranes, the tall T-shaped structures found on urban building sites.



Tower Crane

Mobile Cranes

Gantry Crane

TYPES OF CRANES

Littered across big-city skylines, **tower cranes** are likely the most familiar type to the layman. But they are by no means the only way that engineers have configured pulleys and levers to lift enormous amounts of weight.

The most common type of crane is one that sets on top of wheels—whether trucks, railcars or caterpillar crawler wheels—called a **mobile crane**. "The big advantage of the mobile crane is that it doesn't sit there all the

time—when it's done with one thing, I can put it on another job," explains longtime construction engineer Cliff Schexnayder.

Mobile cranes have one of two kinds of booms (arms). One, called a **lattice boom**, "looks like a bunch of Tinker toys put together," Schexnayder says. The lattice work, though locked into a fixed height, is extremely sturdy, and can lift much more than tower cranes. "Lattices are very expensive," he adds, "but they're useful, say, when you're building

petrochemical plants and have to pick up a very large, heavy load."

The second type of mobile crane boom is a **telescopic boom**. Telescopic booms hold a series of smaller tubes, nested one inside of another like stacking Russian dolls. Hydraulic pumps are used to pull the sections out, thus extending the length of the boom.

Gantry cranes—found at ports and railroads to move cargo on and off ships or railcars—are a

type of overhead crane. With this type, a long, steel rail is mounted high off the ground, between two sturdy steel legs that straddle the load. A trolley, which holds pulleys and the hook (called a hoist), runs horizontally from one end of the rail to the other. The crane operator drops the hoist vertically from the trolley to the load, hooks it on to the load, lifts it back up, and then moves it horizontally along the rail to the destination.



Renovations to structures like the Tacoma Narrows Bridge in Washington State, above, would be virtually impossible without the assistance of tower cranes to do the heavy lifting.

At ports around the world, cranes are used to transfer heavy freight to and from cargo ships, below.



Tower cranes—which can rise, unsupported, 250 feet in the air, reach just as far horizontally, and weigh several hundred tons—rely upon pulleys and another simple machine: the lever.

The first step in building a tower crane is to bolt its upright steel tower firmly to a cement foundation on the ground, so that it does not tip over while lifting. This cement “pad” is huge—up to 30-by-30-by-4-feet, and 400,000 pounds, or 200 tons. “That [horizontal] axis is your counterweight, like a tree with its roots spread out,” explains Cliff Schexnayder, eminent scholar at the Del E. Webb School of Construction at Arizona State University.

On top of this tree trunk rests the “slewing unit,” a box that consists of the gears and motors that allow the crane to rotate. (In this unit, steel cables wrap around a drum, much like the ropes wrapped around a wooden axle in ancient times.) On top of that sits the cab, which holds all of the sensors and electronics that a trained crane operator needs to safely move the crane.

A horizontal beam—the part that makes the lever of this lever machine—also sits atop the tower. Most of the beam extends in front of the tower, leaving a short arm sticking out behind it, much like an unbalanced seesaw. The long arm, called the jib, holds the heavy load. The short arm holds counterweights that prevent the whole crane from tipping over.

Because of their expense—large tower cranes cost upward of \$750,000 to build—most construction companies rent cranes, the type and size dependent on whatever their specific need at the site. The typical fee for transport, installation and disassembly of a large tower crane runs around \$60,000, on top of a \$15,000 monthly fee.

“All of that is decided in the planning process, before you step foot on site,” Smailes says. For instance, while a high-rise building might use a tower crane in a fixed position, a small building might need just one, mobile crane. (See sidebar, page 11: Types of Cranes.)

To do their jobs, most cranes use “lifting hooks”—sometimes as large as a grown man—to pick up the wire or chain to which the load is attached. Attached to the hook is a safety latch that keeps the load from slipping off. Two hooks—placed at opposite ends—may be used for picking up awkwardly shaped loads, to keep them balanced on the way up.

The most dangerous part of crane operation comes when tower cranes are made taller during construction, a process known as “jumping.” During jumping, the vertical tower part of the crane is temporarily unhooked from its base support and is placed on top of hydraulic jacks. The jacks raise the tower while a new section slides beneath it, then they lower the tower on top of the new section.

“When it’s just sitting on those jacks, it’s not able to take a load or anything,” says Schexnayder. The crane pieces could easily come loose during this vulnerable time. “The most dangerous time with a tower crane is when you jump,” he says.

CRANE ACCIDENTS AND SAFETY

There are three main components to crane safety: crane design; the crane site’s operating environment; and the crane operator’s control.

Accident numbers are largely unavailable in China and Middle Eastern countries, though both China and the United Arab Emirates have a poor international reputation on ensuring worker safety.

In contrast, safety rules are uniform and fairly strict across most of Europe. In France, the installation of a crane is done by companies that specialize in safety, and cannot be done by the company that owns the crane. After installation, a separate government organization must give its safety approval before construction can begin. From 2002 to 2007, France had 10 fatal crane accidents, almost all due to weather conditions or technical failures.

By comparison, 72 workers across the United States died in crane-related accidents in 2006 (the most recent year that statistics are available), according to the federal Occupational Safety and Health Administration (OSHA).

Experts, however, are quick to point out that there are thousands of construction projects yearly that use cranes without incident. “When you talk about accidents on a

work site, cranes are not going to be at the top of the list, or even close to it,” says Smailes.

Still, when they do happen, crane accidents are big news. This was particularly apparent in the spring of 2008.

On March 15, in New York City, seven people died when a 6-ton piece of steel—and the enormous tower crane it was supposed to hold up—plummeted 18 stories during a jump.

Ten days later, at a high-rise building site in Miami, a 7-ton section of crane fell on a house, killing two people.

On May 30, two more New Yorkers died when a tower crane’s cab and boom fell away, falling into a nearby apartment building.

On June 11, in Dallas, a cable snapped from a crane hook, killing one.

How exactly these accidents occurred is still under investigation by the cities’ district attorneys, but the blame is generally placed on routine equipment failures, rather than operator error.

With the recent, highly publicized crane accidents, many lawmakers are considering stricter regulations of crane operators, including more pre-construction planning meetings and mandatory licenses.

This summer, in fact, New York City Mayor Michael Bloomberg proposed legislation to increase regulatory oversight of construction sites, including increased

finances for violations. In September—taking both union members and industry officials by surprise—his administration enacted new, stricter crane regulations meant to prevent crane accidents like the ones in March and May. The regulations dictate, among other things, that manufacturers give city inspectors a detailed outline of how they plan to raise sections of the crane as a building gets higher (jumping.) The city must certify the plan before work begins.

But as Schexnayder points out, “New York already has the



HOW TO BECOME A CRANE OPERATOR

Tower crane operators are in constant communication with workers on other parts of the site. “Sometimes the operators can’t even see the load, so they have to find out information from the radio or from hand signals from somebody on the building or on the ground,” says Cliff Schexnayder, eminent scholar at the Del E. Webb School of Construction at Arizona State University.

Crane operators learn their trade not in school, but in an on-the-job apprenticeship. “You might come out of high school and start work at a construction company as what’s called an oiler,” says Richard Smailes, professor of building construction at the University of Florida. An oiler cleans the crane, and keeps the gears greased properly. As an oiler gains more experience and becomes more comfortable around the equipment, a crane operator will slowly teach him or her to use the crane.

With the exception of a few states and municipalities, no special license or certification is required of crane operators.

However, most construction unions require that crane operators meet both written and practical exams before they’re allowed to run the crane solo. “You have to prove that you understand the machine, that you can read the books and interpret what the rules and regulations are,” Schexnayder explains. “But then you also have to get in that seat and show you can do it.”

In Western Europe, most crane operators have specialized training and a certification degree. All operators are required to take and pass a safety course and, before starting work on a new site, must pass a medical inspection.



Tractors built with front-end loaders use a telescopic boom to extend their reach. They are often used to lift less cumbersome loads like lumber on this construction site in Los Angeles, Calif., left.



A low-angle view accentuates how this mobile crane can effortlessly support the structure of this warehouse in Fuzhou City, China, below.

strictest regulations in the country. The rules don't do any good unless you follow them."

TECHNOLOGICAL UPGRADES

Though the underlying physical principles haven't changed, crane technology has seen a few upgrades in the past few decades.

"There are always small innovations, always developments," says Burkart. "They have significant amounts of electronics on them now that have made them more reliable, safer, and I dare say they will continue to develop."

"In the old days, a crane was strictly a mechanical type thing," Schexnayder says. Friction clutches, controlled by the operator, operated the drum and caused the cable to move. But today, most of that movement is done by either hydraulic or electric motors. A dashboard of gauges and sensors in the cab tells the crane operator exactly where every piece of equipment is located, how much more weight it can handle, and even how close it is to electric wires. "Now it's just a lot easier for the crane operator," he says.

In the next decade, Schexnayder thus

predicts "more emphasis on safety education," both from unions and crane manufacturers.

He also predicts that, thanks to climbing gas prices, people will be driving less and will be less keen to life in the suburbs.

"With people moving to the city to get out of driving their automobiles, I can visualize a lot more crane use and more vertical building," he says.

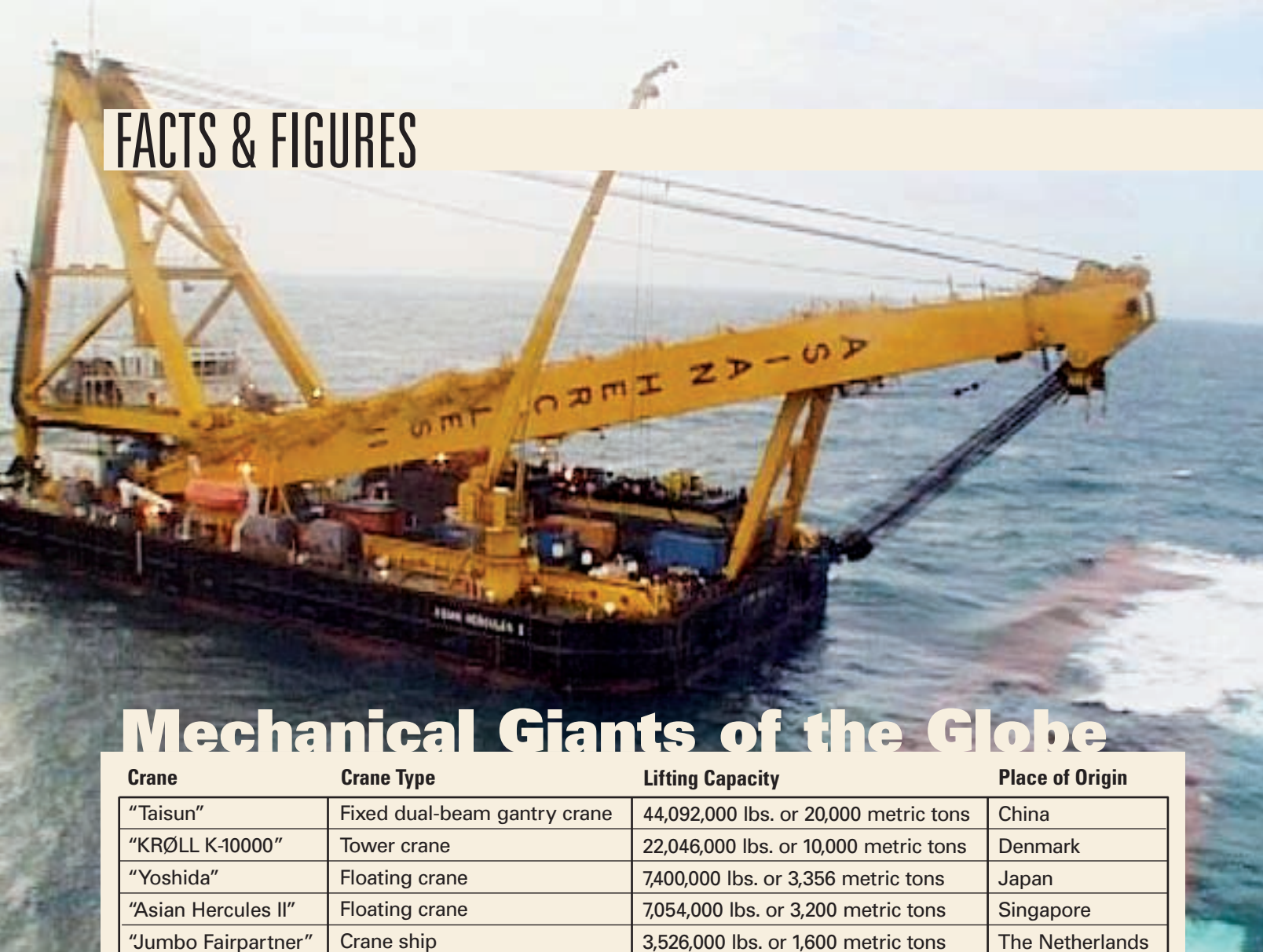
With this increased use, technological advances will come in curbing carbon emissions from the machines. "Manufacturers will be working to make cleaner cranes, and lots more of them," Schexnayder says. ■

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- Air receiver manifolds

FACTS & FIGURES



Mechanical Giants of the Globe

Crane	Crane Type	Lifting Capacity	Place of Origin
"Taisun"	Fixed dual-beam gantry crane	44,092,000 lbs. or 20,000 metric tons	China
"KRØLL K-10000"	Tower crane	22,046,000 lbs. or 10,000 metric tons	Denmark
"Yoshida"	Floating crane	7,400,000 lbs. or 3,356 metric tons	Japan
"Asian Hercules II"	Floating crane	7,054,000 lbs. or 3,200 metric tons	Singapore
"Jumbo Fairpartner"	Crane ship	3,526,000 lbs. or 1,600 metric tons	The Netherlands
"MoMo"	Mobile crane	3,526,000 lbs. or 1,600 metric tons	The Netherlands
"Kockums"	Gantry crane	3,306,000 lbs. or 1,500 metric tons	Sweden

Sources: www.darkroastedblend.com; <http://www.bbc.co.uk>; www.towercranes.com; www.turbosquid.com; www.gcaptain.com.

Above: Asian Hercules II, Below: Yoshida







While aboard the *USS Missouri* in Tokyo Bay, Japan, Gen. Douglas MacArthur signs as supreme allied commander, with Allied powers representatives behind him, during the formal surrender ceremonies, above. During the Korean War, Gen. MacArthur stood by his men at the front lines above Suwon, Korea, far right.



It was a homecoming for Gen. Douglas MacArthur when he spoke at the United States Military Academy at West Point on May 12, 1962. It was also his farewell.

MacArthur, who graduated first in his class at West Point in 1903 and served as superintendent of the academy from 1919 to 1922, had returned to accept the Sylvanus Thayer Award for outstanding service to the nation. The son of a Civil War hero, he had a distinguished military career that lasted 48 years and included terms as chief of staff of the U.S. Army, Pacific army commander in chief in World War II and commander of the United Nations forces in Korea.

When he retired in 1951, MacArthur told Congress, "Old soldiers never die; they just fade away." By the time he addressed the 2,200-member Corps of Cadets that spring day in 1962, MacArthur's days of active service had long passed. At the time of this speech, MacArthur was 82 years old and in failing health. For him, this was goodbye. "The shadows are lengthening for me," he told the cadets. "Today marks my final roll call with you. I bid you farewell."

And then for 40 spellbinding minutes, MacArthur articulated the principles that guided him, the members of the audience that day, and the generations that had come before and would follow after him in West Point's long gray line of cadets. Duty. Honor. Country. MacArthur died two years after delivering the speech. But the words he spoke will never fade away.

Duty Honor Country

Introduction by Maria Blackburn

No human being could fail to be deeply moved by such a tribute as this [Thayer Award]. Coming from a profession I have served so long, and a people I have loved so well, it fills me with an emotion I cannot express. But this award is not intended primarily to honor a personality, but to symbolize a great moral code — the code of conduct and chivalry of those who guard this beloved land of culture and ancient descent. That is the animation of this medallion. For all eyes and for all time, it is an expression of the ethics of the American soldier. That I should be integrated in this way with so noble an ideal arouses a sense of pride and yet of humility which will be with me always.

Duty, Honor, Country: Those three hallowed words reverently dictate what you ought to be, what you can be, what you will be. They are your rallying points: to build courage when courage seems to fail; to regain faith when there seems to be little cause for faith; to create hope when hope becomes forlorn.

Unhappily, I possess neither that eloquence of diction, that poetry of imagination, nor that brilliance of metaphor to tell you all that they mean.

The unbelievers will say they are but words, but a slogan, but a flamboyant phrase. Every pedant, every demagogue, every cynic, every hypocrite, every troublemaker, and I am sorry to say, some others of an entirely different character, will try to downgrade them even to the extent of mockery and ridicule.

But these are some of the things they do. They build your basic character. They mold you for your future roles as the custodians of the nation's defense. They make you strong enough to know when you are weak, and brave enough to face yourself when you are afraid. They teach you to be proud and unbending in honest failure, but humble and gentle in success; not to substitute words for actions, not to seek the path of comfort, but to face the stress and spur of difficulty and challenge; to learn to stand up in the storm but to have compassion on those who fall; to master yourself before you seek to master others; to have a heart that is clean, a goal that is high; to learn to laugh, yet never forget how to weep; to reach into the future yet never neglect the past; to be serious yet never to take yourself too seriously; to be modest so that you will remember the simplicity of true greatness, the open mind of true wisdom, the meekness of true strength. They give you a temper of the will, a quality of the imagination, a vigor of the emotions, a freshness of the deep springs of life, a temperamental predominance of courage over timidity, of an appetite for adventure over love of ease. They create in your heart the sense of wonder, the unflinching hope of what next, and the joy and inspiration of life. They teach you in this way to be an officer and a gentleman.

And what sort of soldiers are those you are to lead? Are they reliable? Are they brave? Are they capable of victory? Their story is known to all of you. It is the story of the American man-at-arms. My estimate of him was formed on the battle-



In October of 1944, Gen. Douglas MacArthur wades ashore during the initial landings at Leyte, Palau Islands, left. Gen. MacArthur arrives to perform an inspection tour of the South Korean forces after a surprise attack by the North Koreans, opposite right.

field many, many years ago, and has never changed. I regarded him then as I regard him now — as one of the

world's noblest figures, not only as one of the finest military characters, but also as one of the most stainless. His name and fame are the birthright of every American citizen. In his youth and strength, his love and loyalty, he gave all that mortality can give.

He needs no eulogy from me or from any other man. He has written his own history and written it in red on his enemy's breast. But when I think of his patience under adversity, of his courage under fire, and of his modesty in victory, I am filled with an emotion of admiration I cannot put into words. He belongs to history as furnishing one of the greatest examples of successful patriotism. He belongs to posterity as the instructor of future generations in the principles of liberty and freedom. He belongs to the present, to us, by his virtues and by his achievements. In 20 campaigns, on a hundred battlefields, around a thousand campfires, I have witnessed that enduring fortitude, that patriotic self-abnegation, and that invincible determination which have carved his statue in the hearts of his people. From one end of the world to the other, he has drained deep the chalice of courage.

As I listened to those songs [of the glee club], in memory's eye I could see those staggering columns of the First World War, bending under soggy packs, on many a weary march from dripping dusk to drizzling dawn, slogging ankle-deep through the mire of shell-shocked roads, to form grimly for the attack, blue-lipped, covered with sludge and mud, chilled by the wind and rain, driving home to their objective, and for many, to the judgment seat of God.

I do not know the dignity of their birth, but I do know the glory of their death. They died unquestioning, uncomplaining, with faith in their hearts, and on their lips the hope that we would go on to victory. Always, for them: *Duty, Honor, Country*; always their blood and sweat and tears, as we sought the way and the light and the truth.

And 20 years after, on the other side of the globe, again the filth of murky foxholes, the stench of ghostly trenches, the slime of dripping dugouts; those boiling suns of relentless heat, those torrential rains of devastating storms; the loneliness and utter desolation of jungle trails; the bitterness of long separation from those they loved and cherished; the deadly pestilence of tropical disease; the horror of stricken areas of war; their resolute and determined defense, their swift and sure attack, their indomitable purpose, their complete and decisive victory — always victory. Always through the bloody haze of

their last reverberating shot, the vision of gaunt, ghastly men reverently following your password of: *Duty, Honor, Country*.

The code which those words perpetuate embraces the highest moral laws and will stand the test of any ethics or philosophies ever promulgated for the uplift of mankind. Its requirements are for the things that are right, and its restraints are from the things that are wrong.

The soldier, above all other men, is required to practice the greatest act of religious training — sacrifice.

In battle and in the face of danger and death, he discloses those divine attributes which his Maker gave when He created man in his own image. No physical courage and no brute instinct can take the place of the Divine help which alone can sustain him.

However horrible the incidents of war may be, the soldier who is called upon to offer and to give his life for his country is the noblest development of mankind.

You now face a new world — a world of change. The thrust into outer space of the satellite, spheres, and missiles mark the beginning of another epoch in the long story of mankind. In the five or more billions of years the scientists tell us it has taken to form the Earth, in the three or more billion years of development of the human race, there has never been a more abrupt or staggering evolution. We deal now not with things of this world alone, but with the illimitable distances and as yet unfathomed mysteries of the universe. We are reaching out for a new and boundless frontier.

We speak in strange terms: of harnessing the cosmic energy; of making winds and tides work for us; of creating unheard synthetic materials to supplement or even replace our old standard basics; to purify sea water for our drink; of mining ocean floors for new fields of wealth and food; of disease preventatives to expand life into the hundreds of years; of controlling the weather for a more equitable distribution of heat and cold, of rain and shine; of spaceships to the moon; of the primary target in war, no longer limited to the armed forces of an enemy, but instead to include his civil populations; of ultimate conflict between a united human race and the sinister forces of some other planetary galaxy; of such dreams and fantasies as to make life the most exciting of all time.

And through all this welter of change and development, your mission remains fixed, determined, inviolable: it is to win our wars.

Everything else in your professional career is but corollary to this vital dedication. All other public purposes, all other public projects, all other public needs, great or small, will find others for their accomplishment. But you are the ones who are trained to fight. Yours is the profession of arms, the will to win, the sure knowledge that in war there is no substitute for victory; that if you lose, the nation will be destroyed; that the very obsession of your public service must be: *Duty, Honor, Country*.

Others will debate the controversial issues, national and international, which divide men's minds; but serene, calm, aloof, you stand as the nation's war guardian, as its lifeguard from the raging tides of international conflict, as its gladiator in the arena of battle. For a century and a half, you have defended, guarded and protected its hallowed traditions of liberty and freedom, of right and justice.

Let civilian voices argue the merits or demerits of our processes of government; whether our strength is being sapped by deficit financing, indulged in too long, by federal paternalism grown too mighty, by power groups grown too arrogant, by politics grown too corrupt, by crime grown too rampant, by morals grown too low, by taxes grown too high, by extremists grown too violent; whether our personal liberties are as thorough and complete as they should be. These great national problems are not for your professional participation or military solution. Your guidepost stands out like a ten-fold beacon in the night: *Duty, Honor, Country*.

You are the leaven which binds together the entire fabric of our national system of defense. From your ranks come the great captains who hold the nation's destiny in their hands the moment the war tocsin sounds. The Long Gray Line has never failed us. Were you to do so, a million ghosts in olive drab, in brown khaki, in blue and gray, would rise from their white

crosses thundering those magic words: *Duty, Honor, Country*.

This does not mean that you are war mongers.

On the contrary, the soldier, above all other people, prays for peace, for he must suffer and bear the deepest wounds and scars of war.

But always in our ears ring the ominous words of Plato, that wisest of all philosophers: "Only the dead have seen the end of war."

The shadows are lengthening for me. The twilight is here. My days of old have vanished, tone and tint. They have gone glimmering through the dreams of things that were. Their memory is one of wondrous beauty, watered by tears, and coaxed and caressed by the smiles of yesterday. I listen vainly, but with thirsty ears, for the witching melody of faint bugles blowing reveille, of far drums beating the long roll. In my dreams I hear again the crash of guns, the rattle of musketry, the strange, mournful mutter of the battlefield.

But in the evening of my memory, always I come back to West Point.

Always there echoes and re-echoes: *Duty, Honor, Country*.

Today marks my final roll call with you, but I want you to know that when I cross the river my last conscious thoughts will be of The Corps, and The Corps, and The Corps.

I bid you farewell. ■

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BY EUGENE FINERMAN

THE RISE OF NAPOLEON

“FRANCE HAS MORE NEED OF ME THAN I HAVE NEED OF FRANCE.”
— NAPOLEON BONAPARTE (1769-1821)

NAPOLEON BONAPARTE believed in his greatness. Without that audacious conviction, he would not be the legendary figure in history that he became. He never would have overcome the modest circumstances of his birth. Napoleon was born on Corsica, a Mediterranean island ruled by France but whose impoverished natives were ethnically Italian. In fact, he did not learn French until he was 10, and never lost his Corsican accent. The recipient of a scholarship, he studied at a military academy in Brienne, France. His education there was determined by his social standing. A scholarship boy lacked the aristocratic pedigree required of an officer in the infantry or cavalry. Artillery was considered more menial, so Napoleon was trained for that and received his lieutenant's commission in 1785.

But the caste system that fettered Napoleon's early career was about to be overthrown. France was an 18th-century society constrained by a 14th-century monarchy. Decades of frustration and misrule finally led to a revolution in 1789. The fumbling, obtuse King Louis XVI refused the popular demand for a constitutional monarchy. At the urging of his queen, Marie Antoinette, Louis appealed to his fellow monarchs to rescue him from his own people. In response, a coalition of German states led by Austria invaded France in 1792. Learning of Louis' support of the invasion, France saw no need for a constitutional monarchy—or a breathing king. (King Louis was ultimately executed in 1793.) Then Britain, Spain and Prussia declared war on this revolutionary France.

Fighting against half of Europe, the French army seemed in a poor position to defend the country. In September 1793, Capt. Bonaparte was commanding the artillery at the siege of Toulon, a French port that had been seized by the British navy. Although only a junior officer, Bonaparte



assumed the responsibilities of a general, planning the French attack and then carrying it out. His superiors might have been dismayed by the young man's presumption, but they could not argue with his tactical brilliance and—all the more remarkable for a 5-foot-2 man—his powers of command. The French recaptured Toulon, and Napoleon was the undisputed hero. Since he acted like a general, the government decided that he might as well be one. In three months, Napoleon had risen from captain to brigadier general. He was 24.

Napoleon's next campaign was political, and its stakes were his career. The French government was at war with itself, and the losing factions went to the guillotine. Napoleon had become a general while the Radicals controlled France; so he



In 1812, Napoleon's court painter, Jacques-Louis David, portrayed Bonaparte powerfully despite his famously diminutive stature while he stood in his study at Tuileries Palace.

was associated with that party. When the Radicals fell in July 1794, Napoleon found himself suspended from the army and under arrest. He was soon released from prison, but the new government did not trust him with a command. To re-establish himself, Napoleon applied military tactics to politics: he would win over some key people in Paris, including the most powerful man in the government, Paul Barras, and his lovely socialite mistress, Josephine de Beauharnais.

Perhaps Napoleon only wanted Josephine's ear, but she offered him the rest. Barras did not mind his mistress' infidelity and actually encouraged the marriage of Josephine and Napoleon. She would be getting a husband with a promising future, the Corsican opportunist would be marrying one of the most fashionable women in Paris and—call it a wedding gift—Napoleon received command of an army in March 1796.

France was still at war with Austria and Britain. At the time, Austria and its ruling Habsburg family held a large empire, including Northern Italy and much of Germany. The war had gone in France's favor so far. The invading armies had been driven out and the French armies were advancing to the Rhine. France now planned a campaign to force Austria out of the war. Two armies would cross the Rhine and a third would push through Northern Italy—all heading for Vienna. Napoleon was in command of the Italian invasion with the smallest and worst supplied force of the three armies.

Napoleon had 37,000 men, facing an enemy totaling 50,000. But the Austrians never imagined the speed, tactics and audacity of Bonaparte. Napoleon anticipated the enemy's moves, and he always found and attacked its most vulnerable position. The campaign began in April; in two weeks, the Austrians were in retreat with only half of their army left. Ironically, while Napoleon was conquering Italy, the French offensive across the Rhine had failed. Austria now shifted 100,000 troops from Germany to Italy. The French may have been outnumbered 3-to-1, but Napoleon never gave the Austrians the chance to bring their full numbers to bear. He always outmaneuvered them and attacked, fragmenting the Austrian army and overwhelming it. By April 1797, Napoleon had invaded Austria and was 100 miles from Vienna. With the smallest of France's armies, Napoleon achieved what three armies were expected to do: Austria sued for peace.

Napoleon was the hero of France, but he was restless for more glory. The war with England continued, and Napoleon envisioned a campaign that would undermine the British Empire and establish him as the new Alexander the Great. He would conquer Egypt. The trade and communication between Europe and the Orient passed along the Suez trail. (Yes, there was talk of building a canal.) A French army in Egypt would have a stranglehold on Britain's link to India.

Never lacking confidence, Napoleon expected a glorious military victory, but he also foresaw his campaign as a cultural triumph. He would rediscover Egypt and reintroduce a great civilization long forgotten. So, he assembled several hundred scientists, historians and artists to accompany his expedition. While he conquered, they explored, discovered and illustrated—inspiring a fascination with ancient Egypt



French painter Louis Lejeune captured 'The Battle of the Pyramids' in Egypt, fought on July 21, 1798, now showcased in the Musee du Chateau, Versailles.

that continues to this day.

Napoleon's army landed in Egypt on July 1, 1798, and quickly brushed aside the native forces. But if the French army was invincible, so was the British navy. On Aug. 1, the fleet of Lord Nelson found Napoleon's flotilla anchored near Alexandria; most of the French ships were sunk or captured. Without those ships, the French army was stranded and its supply line severed. The scientists were finding treasures but the soldiers could barely scrounge food. Worse, disease—including the plague—was decimating the army.

With Napoleon's dictated communiqués—press releases—telling the public exactly what he wanted it to believe, the French were convinced that the Egyptian campaign was a complete triumph. However dubious those victories, that was the only good news that the French public heard at the time.

With Napoleon in Egypt, Austria felt emboldened to resume the war. Aided by a Russian army, Austrian forces had recaptured most of Italy and now threatened France itself. Feeling endangered, the French wanted their best general back home to defend them. Since the public demanded it, Napoleon was willing to save France—and flee his hopeless situation in Egypt. (His abandoned army in Egypt finally surrendered to the British in 1801.)

Arriving in France, in October 1799, Napoleon found himself in the center of political intrigues. Barras' corrupt and inefficient government was ready to fall, and the vying factions wanted the support of France's most acclaimed general. He joined a conspiracy to replace the government; however, Napoleon had no genuine interest in replacing one group of infighting bureaucrats with another. If France needed new leadership, he saw himself in that role.

While his fellow conspirators planned one coup, Napoleon staged another. On Nov. 9, 1799, he established himself as the dictator of France. The members of the ousted government protested the coup, but Napoleon had the support of the army and the French public. After years of an erratic, ineffectual republic, France wanted a decisive, charismatic leader.

The scholarship boy from Corsica now ruled France; yet he craved further glory, and war was his means of ascent. For the next 15 years, his ambition would be the history of Europe. Only England defied him; the other powers of Europe—Austria, Prussia and Russia—were vanquished on the battlefield and obliged to come to terms with the Corsican upstart. And those terms were burdensome; he redrew the map of Europe, dissolving German states, coercing Italy from Austria, and forcing Russia to withdraw from Poland. In 1804, he assumed a title befitting his ambition: emperor. He stood in Notre Dame Cathedral and crowned himself: the self-made emperor.

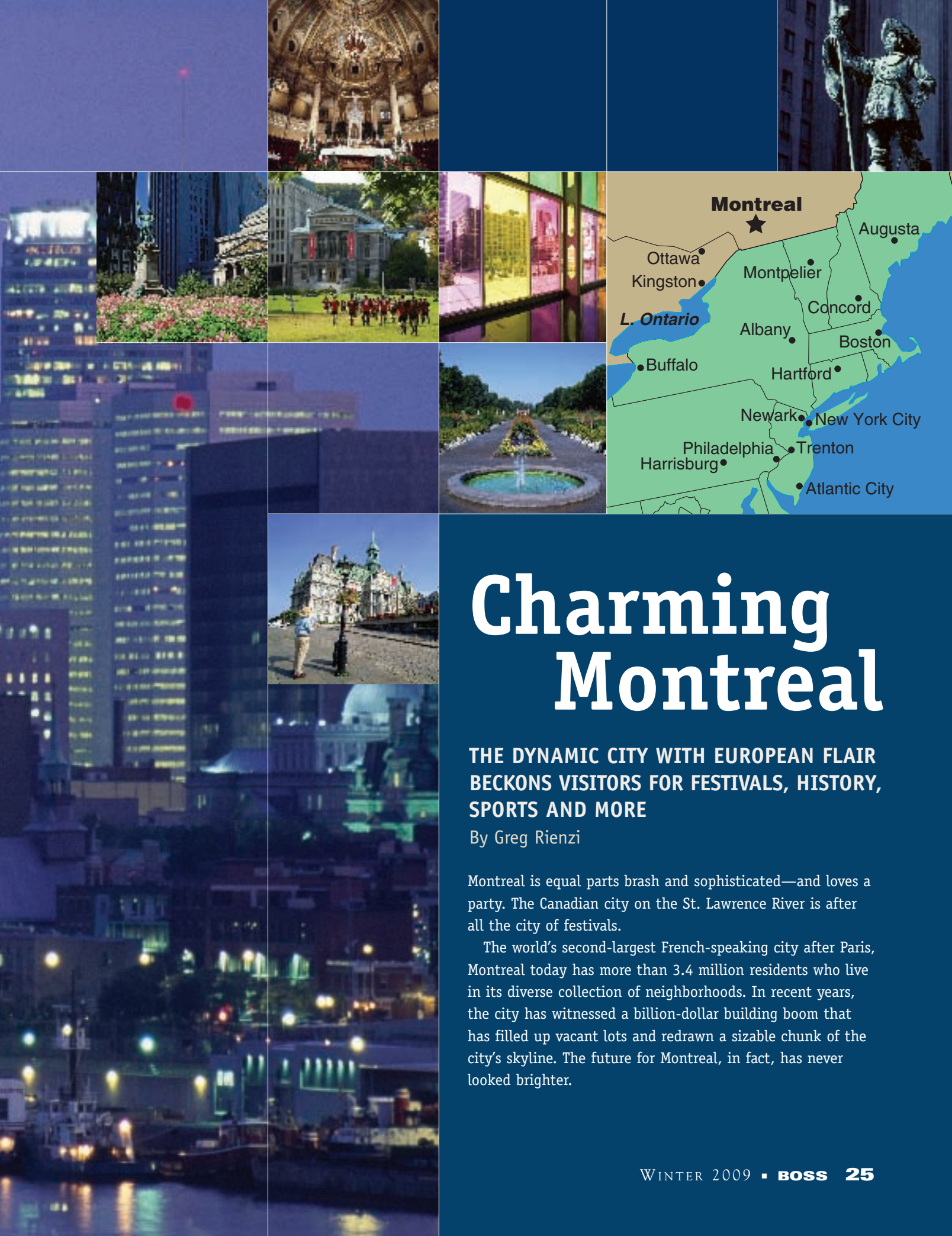
By 1808, continental Europe was under his sway. He had nothing more to gain from wars; but his restless ambition could not accept peace. The brilliant general and audacious gambler seemed to need war. But it never occurred to him that he could lose. In 1808, he invaded Spain, where his army became bogged down in a vicious guerrilla war. Without extricating France from the Spanish fiasco, he invaded Russia in 1812. Of his 500,000-man army, less than a fifth of them survived the Cossacks and the Russian winter.

In the wake of these defeats, Austria, Prussia, Russia and Britain united against him. With his veterans dead in Russia or trapped in Spain, Napoleon could only muster raw recruits against the veteran armies of Europe. Even his genius was no substitute for trained soldiers. By 1814, the allied armies were in France, besieging Paris; and Napoleon was compelled to abdicate.

But even as his empire collapsed, he was convinced that his genius and luck would not fail him. Exiled to the Mediterranean island of Elba, he plotted his return to France and glory. Escaping in 1815, he found the French ready to march again to his command: it was the road to Waterloo. The victors now exiled Napoleon to an island in the North Atlantic, St. Helena. There he would live the last six years of his life, writing his memoirs and embellishing his legend.

In both his rise and downfall, he achieved a name and reputation that remain indelible. ■





Charming Montreal

THE DYNAMIC CITY WITH EUROPEAN FLAIR BECKONS VISITORS FOR FESTIVALS, HISTORY, SPORTS AND MORE

By Greg Rienzi

Montreal is equal parts brash and sophisticated—and loves a party. The Canadian city on the St. Lawrence River is after all the city of festivals.

The world's second-largest French-speaking city after Paris, Montreal today has more than 3.4 million residents who live in its diverse collection of neighborhoods. In recent years, the city has witnessed a billion-dollar building boom that has filled up vacant lots and redrawn a sizable chunk of the city's skyline. The future for Montreal, in fact, has never looked brighter.



A tourist appreciates Montreal's European façades, top left. With the cobblestone streets lit up, Old Montreal welcomes tourists, top right. Named after the French navigator Jacques Cartier, the plaza housing Place Jacques-Cartier and City Hall is now a popular meeting spot filled with musicians, vendors and patrons, bottom left.

When touring the city, why not start at the top? Plateau Mont-Royal, also known as the Plateau, offers some of the city's best views and architecture, characterized by old-style stone masonry buildings topped with wrought-iron spires. The once working-class neighborhood now is home to students, artists and young families who take advantage of its many designer boutique shops, funky thrift stores, thriving arts scene and wealth of cafés, pubs and restaurants.

The hip neighborhood features some of Montreal's best streets for strolling. Boulevard St-Laurent, often referred to as "The Main," overflows with chic bistros and clubs where locals and visitors come to eat and play. Rue Prince-Arthur, named after Queen Victoria's third son and former governor-general of Canada, is a very pedestrian-friendly street where on a nice day you're likely to find throngs of people sipping wine or beer on restaurant terraces. Perhaps the city's trendiest area, Rue St-Denis has shops of all descriptions and some of the best restaurants in town.

After a day of shopping, walk over to Mount Royal Park, the city's largest green space and a popular destination for joggers and those who just want to lie on a blanket and relax. The 500-acre park—designed by Frederick Law Olmsted, who also designed New York's Central Park—offers an unmatched view of the city, spectacular both by day and night.

The city, originally named Ville-Marie, dates back to 1642, then a tiny French settlement on the banks of the St. Lawrence River, a tip of land now part of Old Montreal. In the 18th century, the town grew up and was fortified with a massive stone wall. The city first came under French control, then fell into British hands.

Montreal was incorporated as a Canadian city in 1832. The industrial revolution and the opening of the Lachine Canal spurred growth of the city's downtown area. Skyscrapers began to take root in the 1930s and modern-day Montreal was born.

The past, however, is alive and well in Old Montreal. Visitors can step back in time and walk along narrow cobblestone streets, flanked by 18th- and 19th-century grey-

MONTREAL FACTS



Culture and Language: Montreal has a strong European flavor and the first language of most residents is French. While English will take you anywhere you want to go, a little “bonjour” and “merci” goes a long way with a shop owner or hotel manager. The proudly open-minded city is also a mosaic of ethnic cultures and lifestyles, offering seemingly something for everyone’s tastes and attitude.

Getting there: Fly into Montreal-Trudeau Airport, which serves all the big airlines and offers many direct flights from major cities around the world. The downtown area is roughly a 20-minute (and \$35) cab ride from the airport.

Getting Around: There’s no need for a rental car. Montreal is a great walking city and nothing is spread too far apart. You can walk from Old Montreal to downtown, for example, in roughly 20 minutes. Montreal also has a vast network of cycle paths, with some 400 miles spanning the city. Bike rentals run about \$25 to \$30 a day.

The city’s public transportation system is excellent. Its clean and efficient subway system connects all the popular destinations. As a bonus, every Metro station in Montreal is aesthetically distinct and decorated with pieces of public art, including sculptures, frescoes and stained glass.

Weather: The temperatures roughly vary from 16 to 72 degrees Fahrenheit (-9 to 22 degrees Celsius), depending on the season. However, summer (June-August) highs can reach 80 degrees F (26C) and winter (December-February) can bring plenty of snow. It can get humid and rainy. Not Seattle rainy, but pack an umbrella.



When to go: The high season in Montreal runs from May to September. One can argue it’s worth the crowds and reservation hassles (hotels fill up quickly despite higher rates during this period) to take advantage of the warmer weather and full slate of festivals. Be warned, it can get very humid come summer.

What to do: Nature lovers should visit the Montreal Biodome, which houses fauna and flora from different ecosystems in the Americas. Once inside, you can explore a tropical forest or step onto polar shores. If tiny, creepy crawly creatures are your fancy, flutter over to the Montreal Insectarium and see all the wonders of the insect world. Complete the nature hat trick with a tour of the Botanical Garden, best visited in the summer.

The city is home to 30 museums. Two highlights are the Montreal Museum of Fine Arts, the oldest art museum in Canada, and the Canadian Centre for Architecture, known for its vast, unique collections.

You should, of course, tour Old Montreal, and what better way to see the historic portion of town than by horse-drawn carriage down its cobblestone streets.

During hockey season, check out the Montreal Canadiens, one of the NHL’s original franchises and its most decorated. The Canadiens play their home games at the Bell Centre, the busiest arena in the country.

In the winter, drive 90 minutes to ski Mont Tremblant. The Mont Tremblant Resort offers some of the best skiing in Canada and is also a hot spot for shopping and night life.

For another adrenaline rush, raft the Lachine Rapids.

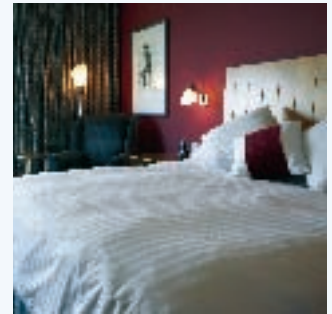


Where to eat: The city boasts many cuisines but is highly regarded for its French restaurants. L’Entrecote Saint-Jean on Peel Street is an ideal place for a romantic dinner or business lunch. For even more adventurous and artistic French cuisine, Toque has been the place since 2004. Its renowned chef changes the menu daily, but the exceptional lamb entree has been a mainstay, ditto its lengthy wine list.

Many locals swear by Au Pied de Cochon in the Mont-Royal neighborhood. The menu features an array of game meats, pork, seafood and foie gras prepared every which way.

The trendiest restaurant street is the lower strip of Boulevard St. Laurent. If you’re in the neighborhood, you are obliged to stop by Schwartz’s Hebrew deli and sample some of the city’s famous smoked meat. There’s bound to be a line, but it goes quick.

With all apologies to New York, Montreal might also be the bagel capital of the world. The locals boil them in water and honey and then cook these delicacies in a wood-burning brick oven to leave them soft inside and crispy outside. Whether you want yours with cream cheese or smoked salmon, the place to go is St-Viateur Bagel & Cafe.



Where to stay: The past five years have witnessed a boutique hotel explosion in the city. The Opus Hotel blends modern design and Montreal’s chic style. The Opus, ideally located in the downtown area on the corner of Sherbrooke and St-Laurent, made both *Fortune* and *Wallpaper* magazine’s list of best business hotels in 2008. Another new boutique hotel that consistently gets top marks is the Hotel Gault, in the heart of Old Montreal. The innovative Gault’s 30 loft-style rooms feature a minimalist style with touches of old Europe. For a mammoth dose of gentlemen’s posh and pampering, the place is Hotel Le St-James. Just ask the Rolling Stones, who stay there when in town.

For a very unique bed and breakfast experience, try the Le Petit Prince, in downtown Montreal. Le Petit Prince, owned by an Italian with a wry sense of humor, sits on a quiet secluded street in the heart of the city and offers a variety of playfully, yet elegantly, designed rooms. Take your pick from ones that offer a fireplace, hot tub or private balcony. Some very affordable options in town are Auberge de la Fontaine, near Lafontaine Park, and Delta Montreal in the downtown area.



stone buildings and other architectural delights unique to North America. Stop for a coffee at any café and you'll feel transported to Europe.

In the summer, the historic city's streets fill with performers, artists and musicians. Many gather at the Place d'Armes, the popular square where you'll find the city's most famous landmark, the twin-towered Notre-Dame Basilica. Designed in 1824 by James O'Donnell, an Irish-American Protestant architect from New York, the Gothic Revival structure is renowned for the dazzling opulence of its interior.

Walk down to the banks of the St. Lawrence to the Old Port, an area brimming with activity. The Old Port, which draws more than 5 million people each year, is now a thriving arts and entertainment venue with a huge open-air skat-

Since the city's humble beginnings as a trading post in 1642, the Old Port of Montreal has been transformed into a dynamic environment for tourists and locals alike, top left. The cobblestone streets of Montreal have been restored to give the tourists a taste of its European flair, bottom right. The Maisonneuve Monument and the Notre-Dame Basilica are juxtaposed showcasing the church's Gothic architecture in the heart of Montreal, bottom left.



ing rink, IMAX cinema and a Science and Technology Center. The port also offers a wide range of river excursions, such as trips to the islands of Parc Jean-Drapeau, home to the La Ronde amusement park and Casino de Montreal, which now features more than 3,200 slot machines and numerous gaming tables. Even if you don't gamble, the casino is worth the trip for its cabaret theater, martini bars and views of the city across the river.

Above all, Montreal is a shopper's and night life lover's paradise. For those looking for either, head to Crescent Street, the heart of downtown Montreal. This strip runs from Sherbrooke to Rene-Levesque and is lined with trendy restaurants, specialty shops, designer boutiques, cafés and the city's best nightclubs. When the sun sets, this part of town comes alive like no other.

Rue Sainte-Catherine is the primary artery of downtown Montreal and runs north to south. From June to September the street is often closed to vehicles, allowing visitors and Montrealers alike to stroll along the thoroughfare to shop and eat.

Below downtown's busy streets is the famous Underground Pedestrian Network or underground city, a shopper's dreamland and 19-mile-long network of passageways that connect more than 1,700 boutiques and businesses. On a cold day, the underground city offers the perfect escape.

The summer marks the high point in the city's annual festival schedule and if you're in town be sure to check out the Grand Prix of Canada, a popular stop on the Formula One circuit, and the International Jazz Festival, a 10-day event that draws over a million spectators.





An evening shot of the Montreal skyline and Lachine Canal captures the true essence of this multicultural city.

Bill Knapp, eastern Canada territory manager for Dixon Bayco Limited, has lived in and around Montreal for nearly 30 years. He loves the city's historic flavor, in particular Old Montreal and its Little Italy, but says his favorite element remains the summer festival season.

"We have it all: jazz, comedy, the Grand Prix. It's just one festival after another and there is always something going on downtown," Knapp says.

He compares the city's spirit to that of Madrid's; unique, laid back and vibrant. "You've probably heard of our 'joie de vivre' [joy of living]. Well, it's true. The people here are

relaxed and like to let their hair down," he says.

The atmosphere gets more subdued in the winter, he adds—except when it comes to hockey. "This town is ice hockey crazy," he says. "No question."

Pam Macdonald, who visited Montreal regularly the past 40 years and moved there permanently less than two years ago, says that Montreal is a city like no other.

"Montreal has a flavor that is unique and an energy that you feel wherever you go," said Macdonald, a hotel manager in the city's downtown area. "It's a city with a pulse that never stops beating." ◆

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Safety Devices—Working for You

BY PHIL KIMBLE

“Depress brake before shifting out of park.” “Don’t lift chute while mower is running.” The goal of these manufacturer safety warnings is to prevent an unintended, and often dangerous, action. Automotive manufacturers put safety devices in place to prevent sudden, and possibly uncontrollable, movement of their cars. Lawn mower manufacturers install deflection chutes to prevent objects from being hurled from mowers at great velocity. Often viewed as a nuisance, safety devices also appear to slow things down. So, sometimes they are removed or disabled.

One hazardous material recovery company requires its new drivers to ride “shotgun,” in the passenger seat, for six months. During this training period, they receive instruction on proper safety procedures and operation of the various trucks. Because a driver never knows which truck he will be taking to a job site, troubleshooting is a big part of the training, with the focus on how to clear a clogged line. Typically, switching the truck’s pump from vacuum to pressure will dislodge the clog. This is easy to do, but older trucks require manual operation of a special locking valve located near the top of the collection tank. Closure of this valve is necessary to prevent the collection tank from becoming pressurized.

In preparation for his first solo run, a driver gave his rig a good inspection before leaving the terminal for a job at a refinery. Because of tales he’d heard from other drivers about these older rigs blowing up, he made a mental note that the valve handle on top was in the “closed” position.

This started out as a routine run to a refinery that was periodically inspecting valves by disassembling them. Occasionally

oil or other products would spill out. The hazmat truck would suck anything up before it could hit the ground. The driver positioned his truck near the first valve, and then went about getting the truck ready. The vacuum pump was engaged, but nothing happened. Reviewing the possibilities, he decided a hose was clogged. Remembering the valve on top of the tank being in the “closed” position before he left, the pump should have been set for pressure. Nothing happened! With the pump running, he climbed onto the tank to investigate. Once at the top, he saw the valve in the “open” position. Panicked, he knew he had to get to the pump quickly and shut it down before something bad happened. He didn’t make it. With what sounded like a sonic boom, the tank exploded, sending him flying through the air. Luckily, he landed in soft dirt, but still received multiple lacerations, contusions, and a sprained back, which cost him several months of work.

The reason behind this unfortunate event was that the locking mechanism on the valve handle had been “jury-rigged” so that it no longer locked in place. Drivers did this because of the location of the valve, the awkwardness of the lock and the frequency of use. As a result, during the drive from the terminal to the refinery, vibration caused the valve handle to change position.

Safety devices, such as the locking handle on the valve, are there for a reason. Let’s “Keep It Safe” by making sure all safety devices and mechanisms are in place and functional. Tampering with or removing these devices is extremely dangerous and often an OSHA violation. Doing so can be more of a pain in the back than it’s worth. ■



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Sleep: A Wake-Up Call

BY KRISTI BIRCH

If you love sleep and you're not getting enough of it, you're not alone. Thanks largely to a 24/7 lifestyle, Americans average only 6 hours, 40 minutes of sleep a night during the week and 7.5 hours on weekends, according to the National Sleep Foundation. And the problem is not unique to the Western world. According to a 2005 *Journal of Sleep Medicine* article, the Japanese average only 6 hours and 53 minutes per night.

Americans haven't always been so sleep-deprived. People averaged 8.5 hours a night in 1960, according to the American Cancer Society. "We know that for each of the last few decades, the average amount of sleep has dropped, on average, half an hour," says Dr. Charlene Gamaldo, assistant director of the Johns Hopkins Hospital Sleep Disorders Center. Most of us would love to catch a few extra zzzs.

And we should. Sleep matters. When you sleep, the cells in your body produce proteins, which enable cells to grow and repair themselves. That's why a lack of sleep not only makes you grumpy and unable to concentrate, but can also damage your immune and endocrine system. Recent studies have shown that a sleep deficit can increase your risk for different cancers, high blood pressure, heart disease and diabetes. It's also been linked with injuries and death. Drowsy drivers cause more than 100,000 car crashes and 1,500 deaths a year in the United States, according to the National Highway Traffic Safety Administration. And the National Sleep Foundation reports that according to data from Australia, England, Finland and other European nations, all of whom have more consistent crash reporting procedures than the United States, tired drivers represent the cause of 10 to 30 percent of all crashes.

Poor sleep also has been linked to obesity, because sleep deprivation can affect your metabolism. "Your body sees the deprivation as a stress response, so your body wants calorie-dense food and you crave things like carbs," says Gamaldo. "And with the craving for calorie-dense food, it seems that the thyroid also gets turned down, so the food isn't burned efficiently and is stored as fat."

Tips for Better Sleep

- Establish consistent sleep and wake schedules, even on weekends.
- Create a regular, relaxing bedtime routine such as soaking in a hot bath or listening to soothing music. Begin an hour or more before the time you expect to fall asleep.
- Create a sleep-conducive environment that is dark, quiet, comfortable and cool.
- Use your bedroom only for sleep and sex (keep "sleep stealers" out of the bedroom — avoid watching TV, using a computer or reading in bed).
- Sleep on a comfortable mattress and pillows.
- Finish eating at least two to three hours before your regular bedtime.
- Exercise regularly during the day or at least a few hours before bedtime.
- Avoid caffeine and alcohol products close to bedtime and give up smoking.

Source: National Sleep Foundation

But how much sleep do you really need? The American Academy of Sleep Medicine recommends 7.5 to 8.5 hours, but needs vary by individual, and some people fall outside that range in both directions. And don't believe the common misconception that you'll need less sleep when you enter your golden years. "As we get older, our ability to drop into a deep sleep isn't as good, and we wake up easier," says Gamaldo. "But our sleep requirement remains the same."

To determine how much sleep is right for you, pay attention to how you feel with different levels of shut-eye. Are you sleepy during the day? Are you drowsy while driving? Do you need caffeine as a pick-me-up?

If you feel tired and experimenting with longer sleep periods doesn't help, consider seeing your doctor or going to a sleep clinic to be evaluated for a sleep disorder. *The Journal of Sleep Medicine* study reports that one in four individuals worldwide do not think they sleep well. Sleep-robbing problems such as restless leg syndrome, chronic insomnia or sleep apnea, a common condition in which a person stops breathing for a few seconds hundreds of times a night, are treatable disorders. "Still, the No. 1 cause of people being sleepy is just not getting enough sleep," says Gamaldo.

And while napping might help, Gamaldo recommends no more than 20 to 40 minutes at a stretch. If you nap



longer, she says, you can drop into deep sleep and it will be harder to fall asleep at night. Also, don't assume that you can miss a lot of sleep during the week and then "catch up" on weekends. Many researchers believe that this still may not be as effective as getting the proper amount of sleep every night. Although there are medications to help you sleep, Gamaldo recommends that, in addition to making sure you don't have a sleep disorder, also try to deal with environmental problems first. The doctor says she hears a litany of sleep-busting problems from patients: a significant other who snores, a pet in the bed, lighting up a cigarette (a stimulant) right before lights-out. And these days, many people are on the computer at night, or watching TV late.

"Any stimulation or light through the TV or computer makes your brain think you shouldn't be ready for bed," says Gamaldo. "Curtail the computer use for an hour before bed, and limit the TV use, too." [See sidebar for more tips.]

Sleep is important to feeling good and staying healthy. Gamaldo says that too often, people assume they just have to live with sleep problems when they are treatable. "You should never be resigned to poor quality sleep," she says. ■

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The Fire Hydrant

At your service for more than two centuries

BY LISA DE NIKE

It's nothing less than ironic that something so valuable spends so much of its time unnoticed except by the occasional wandering dog or the motorist cursing the lack of a legal on-street parking space.

Yet, for more than two centuries, the fire hydrant—humble, unassuming and definitely ubiquitous—has been quietly saving lives, not to mention billions of dollars.

How these squat scarlet sentinels of safety came to punctuate our urban landscape is a story of necessity inspiring human creativity and innovation.

Though no one seems ever to have traced the fire hydrant's complete story, the few historians who have broached the subject assert that the device traces its origins back to ancient China, where large metal cauldrons filled with water were stationed strategically at corners for use in dousing flames.

The world's first "fireplugs" (relatives of the modern hydrant) apparently did not appear until the 1660s, when underground wooden street mains in Europe provided a handy source of water. When a fire erupted, early firefighters reportedly would have to dig through the street down to the main before drilling holes into these hollowed out logs. A primitive "pumper" was inserted into the holes, and the lifesaving liquid filled buckets that were then wielded by volunteer brigades. When the emergency was over, those openings would be plugged with wooden stoppers: hence the term "fireplugs."

When London was rebuilt after the devastating Great Fire of 1666, mains outfitted with pre-drilled and pre-plugged holes were constructed above ground in an attempt to ensure that no fire would ever again consume the city. By the middle of the next century, those wooden plugs had been replaced by metal

valves that could be opened and closed at will, making access to water even more convenient.

A leap in hydrant technology occurred in Philadelphia around 1800, when engineers in the City of Brotherly Love installed a water-delivery system that included a network of steam pumps that pulled water from the nearby Schuylkill River into a series of standing pipes.

Small wooden casements were constructed around those pipes to protect them from the weather, creating the first "hydrants." Records show that by 1811, Philadelphia had 230 of these wooden hydrant pumps and 185 new, cast-iron hydrants, which were just beginning to be used.

Before long, someone had the idea of rigging these early hydrants with fittings shaped to fit the hoses that fire brigades were beginning to use and another leap in hydrant technology was made.

Though this design was a definite improvement over its predecessors, it still had one large drawback: because the water was standing at the ready in the pipes all the time, it often froze in cold weather. By 1812, a "dry barrel" hydrant had been designed, in which water flows into the hydrant through a valve located below the frost line, but then drains from the hydrant when it's not being used.

By the 1850s, this style of hydrant was widely used and despite some design improvements, new materials and techniques, today's hydrants really are not much different. Stem nuts at the top open a valve to admit water and a main valve, when closed, drains water out and down into the pipes. (A slightly different, "wet" style hydrant—filled with pressurized water at all times—is popular in warmer climates, such as in California and Florida.) Hydrants, in fact, have changed so little that photos of Civil War-era hydrants remain quite recognizable today. And fire hydrant aficionados don't expect them to change much any time soon.

"My guess is that the fire hydrant of today will look very similar to the fire hydrant of 2101," said Thomas Ingalsbe, a fire hydrant buff who runs www.firehydrant.org, a Web site for fans of the lifesaving device. ■





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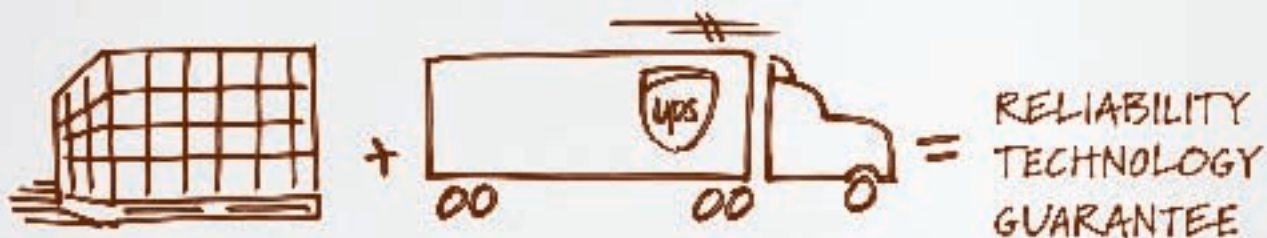


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