



Harvard's 1912 baseball team. Wingate (front at left, holding cap) was Fenway's first batter.

first run. In the fifth, the Red Sox starter struck another RBI single to give his team a 2-0 lead. Meanwhile, the Crimson's bats stayed as cold as the weather, giving the Harvard fans few opportunities to remove their hands from their coat pockets (except possibly to take surreptitious nips from flasks buried inside).

Harvard finally got to Hageman in the fifth when captain Robert Potter, A.B. 1912, struck a well-placed single between short and third, but that would be the team's only base hit of the afternoon. The closest the Crimson came to scoring occurred in the sixth when the centerfielder was cut down at the plate attempting to reach home on a double steal.

By then, dusk was settling in, and the mud-caked ball became more difficult for fielders to pick up through the snowflakes. Fans were beginning to leave, and Hageman had the Harvard boys at his complete mercy as well. After the Crimson were retired in the seventh, Stahl signaled the umpire, and the game was called on account of the freezing temperatures, with the Red Sox besting their Cambridge guests 2-0.

Against a professional team destined for a World Series victory that fall, Harvard made a respectable showing in its first game of the year, particularly given Sam Felton's erratic performance. In five innings, the Crimson starter walked 10 men but, remarkably, allowed only two runs as Boston managed just four singles and stranded 12 base runners. "It was an extraordinary game in this respect," the *Harvard Crimson* reported the next day, "for rarely does a pitcher hold his opponents

to two runs when giving passes at the rate of two an inning. Felton kept the Red Sox hits well scattered and twice retired the side when the bases were full."

Fenway Park's inaugural game was not the only time

a Harvard nine has taken to its turf. The Crimson played exhibitions against the Red Sox in 1913 and 1916, when they actually defeated the reigning world champions 1-0. In 1943 the Sox took revenge, shelling Harvard 21-0. The Crimson also

squared off at Fenway against the Boston Braves, Princeton, and Yale in the 1910s and 1920s, and during the past two decades has played there regularly during the Baseball Beanpot. (The men's ice hockey team has played at Boston's baseball cathedral as well, skating there against Union College in January.)

More recently, the Red Sox have regularly started their spring-training schedule by playing against Boston College and Northeastern. Perhaps it's time for a rematch with Harvard as well. And this year the Red Sox are planning a range of celebrations for Fenway Park's centennial, a milestone no other major league park has reached. There, on April 9, an event will commemorate the historic game with Harvard played a century ago.

~CHRISTOPHER KLEIN

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ALUMNI

A Green Empire

How Anthony Malkin '84 engineered the largest "green" retrofit ever

WHEN IT OPENED in 1931, the Empire State Building was not only the biggest building in the world, it was—with the tallest elevators ever created—an exemplar of the mechanical age. But recently, the landmark had begun to show its years. In 2006, the Malkin family, significant owners who are responsible for the building's day-to-day operations, faced a decision: as Anthony Malkin '84 put it to his father, Peter Malkin '55, J.D. '58, they could either sell the iconic structure or take on massive infrastructure upgrades likely to cost half a billion dollars or more. After securing the agreement of the Leona Helmsley estate (which shares control of the building's operating lease with the Malkins), they decided to take the riskier course and pursue a turnaround of the asset while simultaneously making the building an energy-efficient exemplar of the green age.

People tend to focus on vehicle emissions as a principal source of the heat-trapping carbon dioxide that propels global warming. But building operations actually account for a much greater share of carbon emissions—about 40 percent—and are therefore the single most important contributor to climate change. And buildings, unlike vehicles, are also an *enduring* capital investment. Tony Malkin points out that three decades from now, approximately 80 percent of current structures will still be in use. "If you want to turn back carbon emissions," he says, "you have to deal with existing buildings."

Beyond an undertaking that he hoped would be both environmentally and economically sound for his own building, Malkin aspired to something much larger: creating a reproducible, scalable process for energy-efficiency retrofits that could be adopted worldwide in other big build-

ings, in hospitals, and on campuses. "If we could put all the best minds together on this particular task," he reasoned, "it could fulfill all of my objectives in life, ranging from making money to making the world a better place." It was a green synergy.

In 2007, meanwhile, New York City began discussing legislation designed to drive down energy costs by reducing waste. (Mayor Michael Bloomberg, M.B.A. '66, ratified four such laws in December 2009.) One statute requires that every building of more than 50,000 square feet must make public how much energy it uses per square foot. In that context, Malkin calculated that his business objective—to replace the hundreds of tenants in his 2.85 million-square-foot skyscraper with fewer, larger businesses that would occupy whole floors (new tenants now include Skanska, LinkedIn, and even the Federal Deposit Insurance Corporation)—would benefit from a green rebranding that would also appeal to brokers. "I am a capitalist," he says forthrightly. "I wanted to make money. This is not charity; that's separate."

When he got a call from the mayor asking if he would light up the Empire State Building in green in honor of an event co-sponsored by the Clinton Climate Initiative (CCI), Malkin said, "Sure—if I can attend the event." There, by chance, he ran into Jamie Russell '97 (the younger brother of his College roommate, Andrew '84, now duke of Bedford), then working for CCI, and CCI head Ira Magaziner. They eventually persuaded him to push beyond simple "green" rebranding and instead to undertake a potentially risky "deep energy retrofit" intended to result in energy savings exceeding 10 percent. This was a leap for Malkin: the structure was his largest single real-estate asset, representing almost a third of Malkin

Holdings' total square footage in the city. Initially, in fact, he offered to retrofit a property at 1333 Broadway, but Magaziner demurred: "If we succeed at 1333 Broadway," Malkin recalls him saying, "no one's going to give a damn. We want the Empire State Building."

To make that work, Malkin brokered a nearly risk-free deal for himself: if the extra money he spent on the energy retrofits was not recouped in three years, the engineering firm that projected the savings would have to pay him the difference. With CCI's help, he assembled a team for the project in 2008: the engineering firm Johnson Controls; property manager Jones Lang LaSalle, which wrote the guidelines for outfitting tenant spaces; and the nonprofit Rocky Mountain Institute (co-founded by Amory Lovins '68), a "think and do tank" that promotes sustainable use of resources. Malkin persuaded each of them to work as partners—and in secret, in case the effort failed. They also agreed to forgo payment for the legwork involved in devising the in-

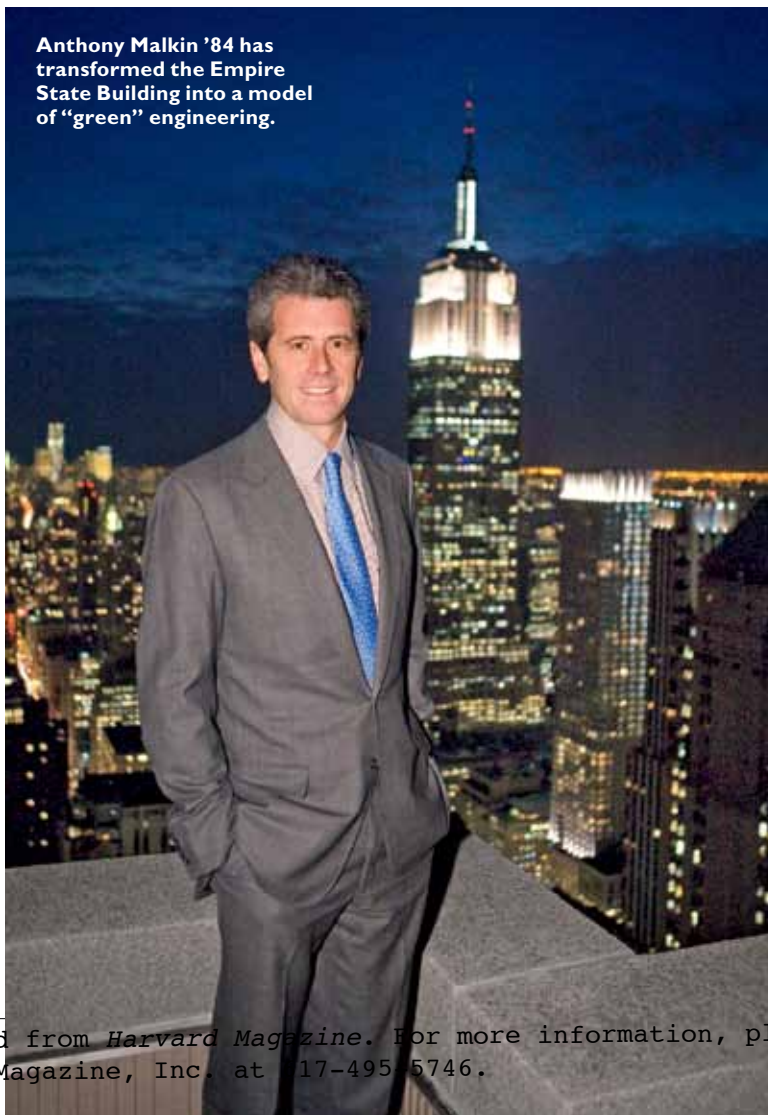
tegrated engineering approach, getting paid only for their other work. Most important, they agreed when Malkin told them they would have first-mover advantage in the marketplace, but "we don't patent this process...we want everybody to copy this. If we succeed at the Empire State Building alone, we have failed."

The team quickly got to work. In the course of 12 months, of the nearly 70 energy-saving measures considered, just eight were chosen. Among those, "the biggest energy-savings contribution is 9 percent, the smallest is 2 percent, and the other six are between 6 percent and 3 percent of the total benefit," reports Malkin. But these small numbers add up to one big number: a total anticipated reduction in energy use of 38.4 percent—a remarkable benchmark that he says will make the project "the most energy-efficient building retrofit in the world."

Perhaps even more surprising is how relatively little the added energy-efficiency measures cost—about \$13 million. "But we spent \$93 million *differently* than we had planned to spend it," Malkin reports. "The point is, by building the measures in...you just spend that \$93 million more intelligently."

Take the decision to upgrade all 6,514 windows. When the project team priced the cost for upgrading, they found that the payback time for that \$4-million expenditure was 10 years, double what was acceptable. But one of Malkin's priorities was to secure full-floor tenants, and the removal of many small offices meant that previously unheated and unventilated hallway space near the elevators and staircases at the building's core was recaptured. That meant the leasable square footage would increase—but the recovered space would add

Anthony Malkin '84 has transformed the Empire State Building into a model of "green" engineering.



Visit harvardmag.com/ extras for videos of Malkin discussing the Empire State Building retrofit.

to the building's cooling and heating load, requiring the purchase and installation of a new chiller to meet the building's cooling needs, at a cost of \$27 million. The engineers quickly realized that the *extra* load from the additional square footage was equivalent to the load *reduction* that would be realized if the windows were upgraded. The *integrated* payback was 3.3 years, not 10 years. (For more information on energy-saving techniques used, see "Green Engineering," below.)

Malkin says the most important lesson learned is that "energy efficiency is not something you *add*, it's something you *build in*." The savings from all the measures adopted at the Empire State Building now total \$4.4 million annually. The additional \$13 million spent, in other words, will be recovered in just three years. Moreover,

the retrofit has also led to "an improvement on the top line," he reports. Where the average rent in 2006 was \$26.50 a square foot, "We're now signing new leases averaging from the high \$40s to the low \$60s with better-credit-quality tenants."

He appreciates that the significance of the project extends beyond his own bottom line. (For years he and his wife, Rachelle Belfer Malkin, have been involved with environmental causes, including the Natural Resources Defense Council.) For one thing, he says, retrofits create local jobs. "If you install wind or solar energy," he asserts, "60 percent to 70 percent of the money involved goes overseas" because such projects require expensive foreign components. He envisions massive in-



More than 3.5 million observatory visitors yearly learn about the benefits of energy-efficient retrofits to buildings.

vestments in building retrofits that emphasize load reduction and energy efficiency and have the advantage of keeping American dollars and jobs at home. Be-

Green Engineering

"Feel that?" asks engineer Paul Rode, straining to open a steel door to a stairwell on the sixtieth floor of the Empire State Building. "That's a seven-and-a-half-mile-an-hour wind." The steady blow is caused by the stack effect, the natural tendency of a building to act like a giant chimney, creating a draft that draws air upward. "We installed automatic dampers to control the airflow, so that the building is ventilated" naturally, explains Rode, of Johnson Controls, which oversaw engineering for the recent retrofit of the iconic skyscraper.

Opened and closed mechanically, dampers modulate the airflow of the entire building depending on outdoor temperatures. That enabled removal of electric-powered fans that did the same thing. But the key to making a building energy efficient, he emphasizes, is not the specific retrofits chosen, but rather taking the right steps in the right order. Rode calls it "design priority," and says it is true for every building.

The first step is load reduction: reducing a building's energy consumption. "You [do it] the same way you would at home," he explains: "insulation, better windows, caulking in the joints." Turning lights off when you have plenty of sunlight is another method. At the Empire State Building, dropped ceilings were removed so more sunlight could reach the core office spaces, reducing the need for artificial lighting. Every desk now has a window in view. Straightening pipes is another load-reducing strategy, as is installing radiative barriers behind steam heaters so that heat is reflected into the building rather than out through the exterior wall. Such measures, Rode explains, mean "your power plant doesn't have to supply as much energy that gets dissipated along the way."

Next comes a focus on energy efficiency—the "classic area everyone gets stuck on and likes to talk about," he says: "more efficient heaters and pumps and lights and air conditioning and LCD monitors, and offices with sensors that dim the lights when

natural light is sufficient." All these measures were incorporated into the retrofit, along with tenant guidelines that result in energy-efficient outfitting of newly leased office space.

Awareness is the third, and continuing, contributor to increasing efficiency. Everyone in the Empire State Building, from occupants to operators, now knows how much energy they are using per square foot, how that compares to the energy used by other people doing similar work in similar circumstances, and what steps they could take for optimal efficiency. Information is based on software calculations; the building's operations staff gets daily reports on energy use so they can make any adjustments needed to have an immediate effect. "Over time," Rode says, "these signals can get people to change their habits."

For the Empire State retrofit, Johnson Controls considered not only all these logical steps, but every other upgrade the combined project team could think of, many of which never saw the light of day. An egg-beater-like wind turbine on the building's spire that might have generated power was rejected, for example, because of the impact on the skyline relative to the small amount of electricity (25 kilowatt hours—enough to power a typical home) it would have produced. Solar panels on the building's setback roofs were deemed too costly, and capturing rainwater for use in toilets proved uneconomical because water is relatively cheap in Manhattan.

The idea was to create "a list of projects that would result in the theoretical minimum energy use of the building," Rode explains. "That concept is important, because until this job, people have approached energy projects in buildings from the perspective of how much they can drive energy use *down*: 5 percent savings, 10 percent savings." By starting instead with the minimum energy use and then letting "economic constraints and business constraints push that bar up, I have a much more rational design process. I know how much money I have to invest. I know what the endpoint is. And I very quickly understand when I reach that point."

yond the cost savings of reduced energy consumption, he says, retrofits represent “capital-cost avoidance”—money otherwise expended to develop new sources of energy—“because a watt saved is so much less expensive through this process than a watt generated by solar or wind.” He has taken this message to Congress, addressing the joint Senate and House economic committee, as well as the staffs of the Senate’s energy and natural resources, finance, and ways and means committees. “We’re also doing a brainstorming session with the Environmental Protection Agency,” he reports.

Meanwhile, the Empire State process is being replicated in cities from Los Angeles to Melbourne, and Malkin is telling his story around the world, from Chicago to London to Beijing, as he hoped. (At home, the Port Authority of New York and New Jersey is redoing several buildings this way.) Businesses need economic incentives to be green, he says—and they need to answer a simple question: “What are the *right* things you can do that are going



All 6,514 windows in the Empire State Building were upgraded. Injecting insulating gases between the panes and adding a heat-reflective film layer made them four times as efficient.

to make more money—and result in a more effective deployment of capital?” Creating bike parking “is nice,” but “‘energy efficiency’ is what’s going to change the world.”

~JONATHAN SHAW

Vote Now

THIS SPRING, alumni vote for five new Harvard Overseers and six new elected directors of the Harvard Alumni Association (HAA). Ballots, mailed by April 1, must be received back in Cambridge by noon on May 18 to be counted. The results are announced at the HAA’s annual meeting on the afternoon of Commencement day, May 24. All Harvard degree-holders except Corporation members and officers of instruction and government, may vote for Overseer candidates. The election for HAA directors is open to all Harvard degree-holders.

For Overseer (six-year term):

Scott A. Abell '72, Boston. Retired chair and CEO, Abell & Associates Inc.

James E. Johnson '83, J.D. '86, Montclair, New Jersey. Partner, Debevoise & Plimpton LLP.

Michael M. Lynton '82, M.B.A. '87, Los Angeles. Chairman and CEO, Sony Pictures Entertainment.

Tracy P. Palandjian '93, M.B.A. '97, Belmont, Massachusetts. CEO and co-founder, Social Finance Inc.

Swati A. Piramal, M.P.H. '70, Mumbai, India. Director, Piramal Healthcare Limited.

Stephen R. Quazzo '82, M.B.A. '86, Chicago. CEO and co-founder, Pearlmark Real Estate Partners.

William H. Rastetter, A.M. '72, Ph.D. '75, Rancho

Santa Fe, California. Partner, Venrock.

Kathryn A. Taylor '80, San Francisco. Co-chair, One PacificCoast Bank Board of Directors.

For elected director (three-year term):

John F. Bowman '80, M.B.A. '85, Santa Monica. Executive producer, Disney Company.

Yvonne E. Campos, J.D. '88, San Diego. Superior Court Judge, State of California.

John H. Jackson, Ed.M. '98, Ed.D. '01, Cambridge. President and CEO, The Schott Foundation for Public Education.

Michael T. Kerr '81, M.B.A. '85, Canyon Country, California. Portfolio counselor

and senior vice president, Capital Research Company.

Sabrina Fung '93, Hong Kong. Executive director and brand managing director, Trinity Ltd.

Susanna Shore Le Boutillier '86, Larchmont, New York. Director, corporate communications, Colgate-Palmolive Co.

E. Scott Mead '77, London. Fine-art photographer and financial adviser.

Brian Melendez '86, J.D. '90, M.T.S. '91, Minneapolis. Partner, Faegre Baker Daniels LLP.

Loulan J. Pitre Jr. '83, J.D. '86, New Orleans. Attorney, Gordon, Arata, McCollam, Duplantis & Eagan, LLC.

A Special Notice Regarding Commencement Exercises

Thursday, May 24, 2012

Morning Exercises

TO ACCOMMODATE the increasing number of those wishing to attend Harvard's Commencement Exercises, the following guidelines are proposed to facilitate admission into Tercentenary Theatre on Commencement Morning:

- Degree candidates will receive a limited number of tickets to Commencement. Parents and guests of degree candidates must have tickets, which they will be required to show at the gates in order to enter Tercentenary Theatre. Seating capacity is limited, however there is standing room on the Widener steps and at the rear and sides of the Theatre for viewing the exercises.

Note: A ticket allows admission into the Theatre, but does not guarantee a seat. Seats are on a first-come basis and can not be reserved. The sale of Commencement tickets is prohibited.

- Alumni/ae attending their reunions (25th, 35th, 50th) will receive tickets at their reunions. Alumni/ae in classes beyond the 50th may obtain tickets from the College Alumni Programs Office by calling (617) 496-7001, or through the annual Tree Spread mailing sent out in March with an RSVP date of April 13th.

- Alumni/ae from non-reunion years and their spouses are requested to view the Morning Exercises over large-screen televisions in the Science Center, and at designated locations in most of the undergraduate Houses and graduate and professional Schools. These locations provide ample seating, and tickets are not required.

- A very limited supply of tickets will be made available to all other alumni/ae on a first-come, first-served basis through the Harvard Alumni Association by calling (617) 496-7001.

Afternoon Exercises

THE ANNUAL MEETING of the Harvard Alumni Association convenes in Tercentenary Theatre on Commencement afternoon. All alumni and alumnae, faculty, students, parents, and guests are invited to attend and hear Harvard's President and featured Commencement Speaker deliver their addresses. Tickets for the afternoon ceremony will be available through the Harvard Alumni Association by calling (617) 496-7001.

~Jacqueline A. O'Neill, University Marshal