



SOUNDS O



A surreal, dark scene with people in white suits amidst falling debris and hanging lamps. The scene is set against a black background. Several people in white suits are visible: one is sitting on a ladder-like structure at the top left, another is standing in the center holding a black object, and a third is on the right. The space is filled with falling debris, including pieces of wood, paper, and small objects. Several large, metallic, cone-shaped objects hang from the top. The overall atmosphere is one of chaos and disarray.

# F SILENCE

The operatic experience can be shattered by the slightest interruption. So how do you build an opera house in the middle of one of Toronto's noisiest districts?

BY PAUL WEBSTER

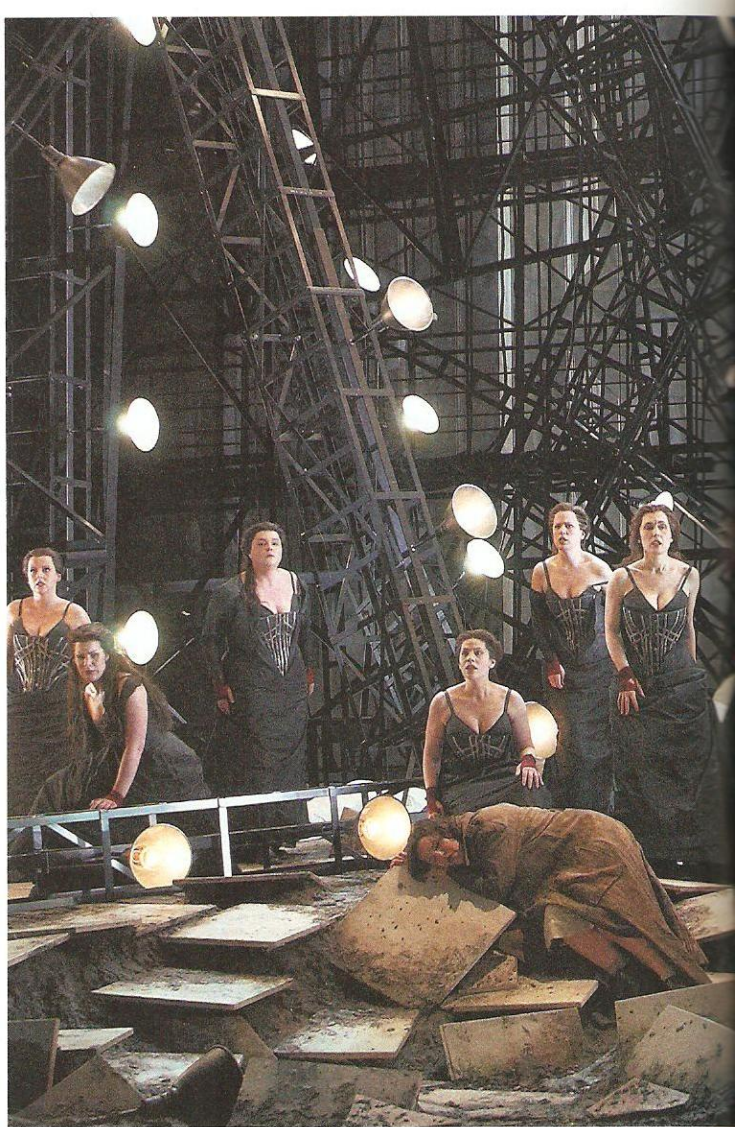


**A** THUNDERCLAP CRASHES, howitzer-like, above the looming, unfinished bulk of the Four Seasons Centre for the Performing Arts, Toronto's new opera house, and Robert Essert, the building's acoustician, winces. With sheets of late-summer rain sweeping toward the downtown construction site, the soft-spoken New Yorker known for his sensitive ears watches as workers attach plate-glass panels to the building. But even as the thunder reverberates off Bay Street's bank towers, Essert is adamant: "No, you won't hear that inside the new opera hall — absolutely not."



Nor does Essert seem concerned when a streetcar — more than 37 tonnes of steel on steel — screeches past University Avenue, the city's most prestigious thoroughfare. "Toronto is built on geology that makes it an excellent transmitter for that streetcar rumble," muses Essert, who has been working for years with architect Jack Diamond and Canadian Opera Company (COC) general director Richard Bradshaw to ensure that none of the sounds of the city intrude on September 12 this year, opening night of Richard Wagner's cycle of four operas, *Der Ring des Nibelungen* (*The Ring of the Nibelung*). "There's also a subway line underneath University Avenue and helicopters landing at a nearby hospital," Essert adds. "But it's all going to be OK. The audience won't hear any outside noise whatsoever. Not even during the ultra-quiet moments — the pianissimos, the pauses, the silences."

**WHILE ESSERT IS RESPONSIBLE** for setting these lofty acoustical goals for the Four Seasons Centre, Diamond and Schmitt Architects are making sure the building will achieve them. With Diamond's lifelong interest in acoustics and performing arts centres, there is little doubt that he will. Based

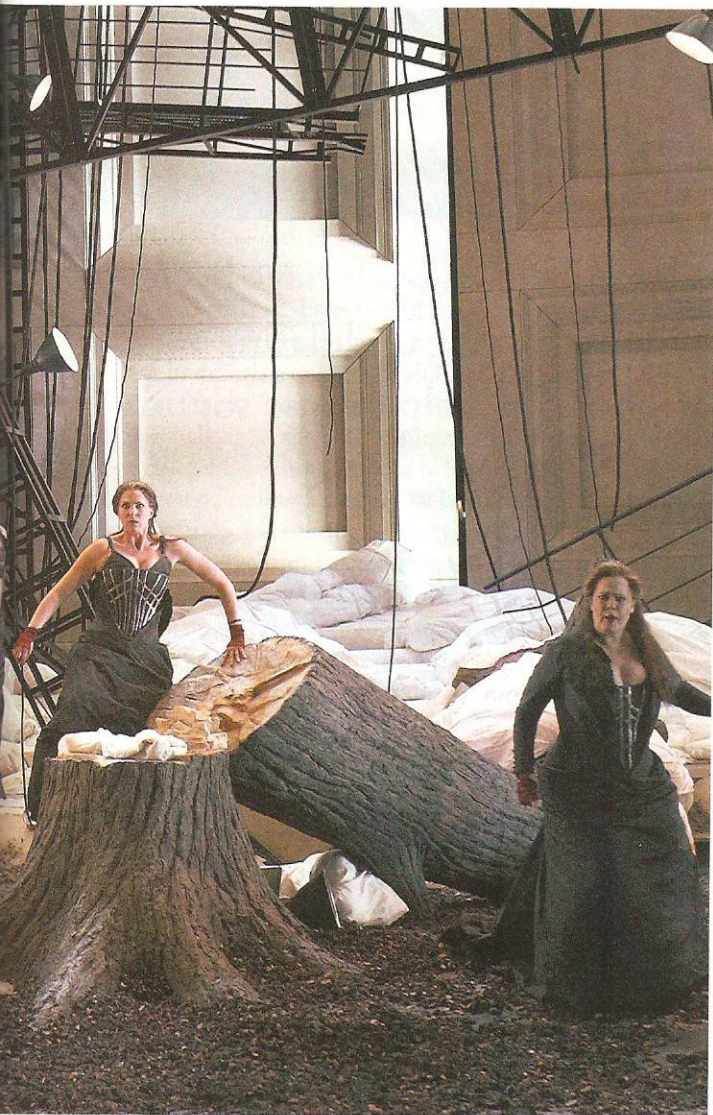


in Toronto, his major projects include Jerusalem City Hall, the Jewish Community Center in Manhattan and the Canadian Embassy in Prague. Touring the building's partially completed interior, Diamond stops on the edge of the proscenium — exactly where the stage ends and the deep orchestra pit that will hide as many as 85 musicians begins. A series of massive reinforced-concrete beams runs underneath where the floor of the orchestra pit will be. "The entire auditorium sits on rubber pads placed beneath those beams," he says. "They absorb shocks, vibrations and sound waves."

He then surveys the other main architectural feature that will separate the audience from the outside world: a five-centimetre gap, which almost completely separates the auditorium's shell-like interior walls from the rest of the building. Diamond reiterates the goal of eliminating all outside sound. "To do that," he explains, "we've built a totally isolated structure within a structure. You could say the auditorium is an egg in a nest."

Bradshaw, the exuberant Englishman famous for his powerful charm, spent more than 10 years rallying Toronto opera lovers to raise \$181 million in government and private

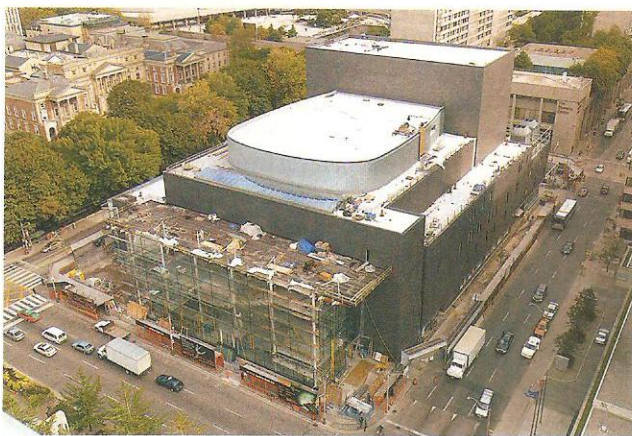
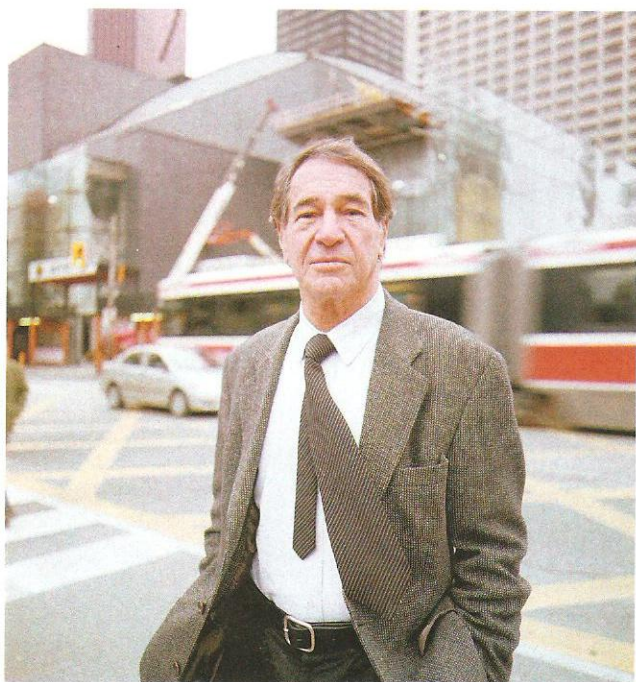




Opera hall acoustics are complex, and the world is dotted with expensive failures.

funds for a centre built specifically for opera, and now his company, the COC, is just months from moving in. It will be a qualitative improvement over the COC's current venue, the 3,200-seat Hummingbird Centre for the Performing Arts. "It's got 3,000 bad seats," says Bradshaw, "and 1,000 of these are really bad seats."

Opera hall acoustics are notoriously complex, and the world is dotted with expensive failures, such as the \$400 million Opéra Bastille in Paris. Critics say its fan shape provides underwhelming sound for opera. So when it came to planning the acoustics for his project, Bradshaw says he accepted no compromises. He insists that Essert and Diamond will deliver what he calls the "wow factor." Heaving himself forward in his chair to reveal a pair of bright red socks above his brown suede shoes, he plucks out a high note: "The new house is being built from the inside out. When it comes to acoustics, we're aiming for a perfect 10."

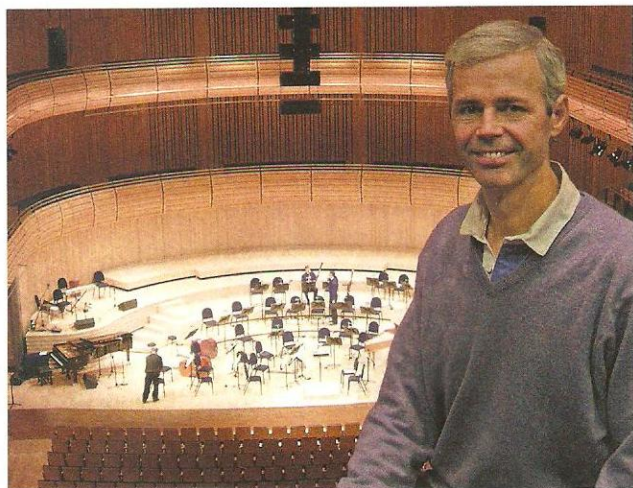


When *The Ring* opens at Toronto's new opera house (under construction, ABOVE) in September, architect Jack Diamond (LEFT) is confident that the urban cacophony surrounding the building will not interrupt performances by Siegfried, the opera's hero (PRECEDING PAGES), or the Valkyries (CENTRE), the tale's mythical handmaidens. The theatre's convex ceiling (FAR LEFT) will prevent music from echoing.



ELIMINATING OUTSIDE NOISE was merely the first step in reaching that goal. Getting the acoustics right inside the house requires considerably more finesse. Essert retreats from outside the storm-lashed Four Seasons Centre for a little peace and quiet of his own. In a hotel lounge across the street from the construction site, he gently flips open his lap-

The back walls have been 'pillowed' using undulating waves of plaster to help diffuse sound.



Acoustician Robert Essert ensures sound quality in arts centres worldwide, including The Sage Gateshead in England (ABOVE).

top and scrolls through an impressive list of international opera projects — opera houses in Bruges, Belgium and Singapore, as well as the Toronto Centre for the Arts in North York and Vancouver's Chan Centre for the Performing Arts at the University of British Columbia. He pulls up what he calls a "sound-burst diagram" (OPPOSITE TOP), in which sound emanating from the stage is depicted as tiny points radiating through the hall and reflecting off its every surface. Essert points out that as the particles reflect back toward the stage, up to 90 percent of the sound audible to the audience will have bounced off the walls. That's a good thing, he says, "because the human ear perceives sound to be richer if more of it is reflected."

For the audience to enjoy that richness, however, the auditorium must be small enough for sound, moving at 340 metres per second, to travel around the room quickly enough for the lyrics to be comprehensible. If the room is too big and the sound takes too much time to reverberate, explains Essert, the delay results in echoes that distort music and words.

Most of the great opera houses in the world have around 2,000 seats or less. And because seats, like people, were smaller in previous centuries, many of the great old opera houses are quite tiny. As halls got bigger, instruments, such

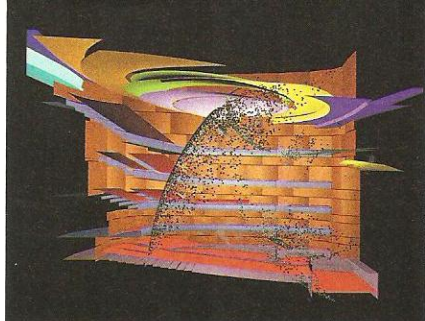
as the trombone, evolved to become louder. Essert considers 2,000 seats to be a great advantage for contemporary instruments. Renowned opera houses, such as Glyndebourne in East Sussex, England, and the Munich National Theatre, are about the same size.

Opera singers also prefer smaller venues. Adrienne Pieczonka, a Toronto soprano who has sung in almost every major opera house, is happy to offer an ovation to Bradshaw and Essert for insisting that the COC learn to live with 2,000 seats. "It's much harder work singing in a big house," notes Pieczonka. She says her unamplified voice often gets lost in the Hummingbird Centre's auditorium. The new opera house, she adds, "reminds me of Glyndebourne, where you don't have to fight to be heard."

To maximize the audience while minimizing the room, Essert, Diamond and Bradshaw agreed on a horseshoe-shaped house — tried and trusted for centuries — with four tiers of surprisingly shallow balconies. The shape of the horseshoe can be tough to get right. Essert and Diamond worked together to plan the shape of the ceiling, walls and



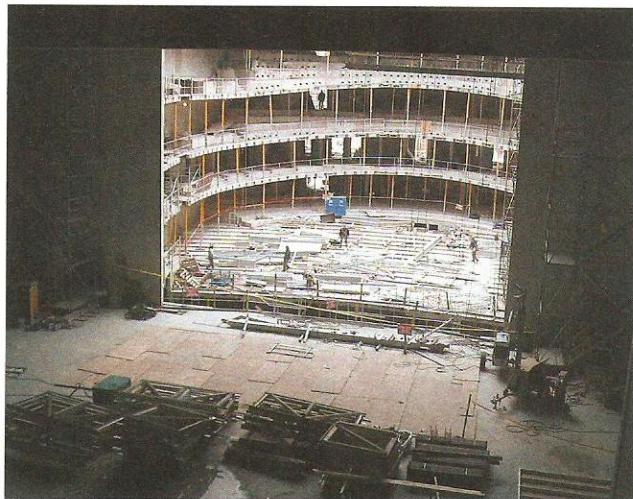




Using "sound-burst diagrams" (LEFT), which show how sound moves around the new theatre, planners perfected the horseshoe shape (BELOW RIGHT).

balcony fronts, as well as the number of balconies and their depth and texture. Essert conducted acoustical tests using computer-modelled 3-D designs produced by Diamond, adding in different textures of stucco walls, padded seats and wooden floors. The model gave them the ability to listen in on the hall as if they were there. "We were looking for anomalies like echoes to test whether we had the right horseshoe shape," says Essert. "We also had to investigate the depth of the balconies, which we made very shallow to prevent sound from getting trapped."

Each of the four balconies will hold just five rows of seats, so the farthest seats are only about 40 metres from the stage. Behind them, the back walls have been "pillowed" using undulating waves of plaster on masonry to help diffuse sound waves. The slightly textured stucco on the walls does the same, a detail Diamond suggests is not unimportant.



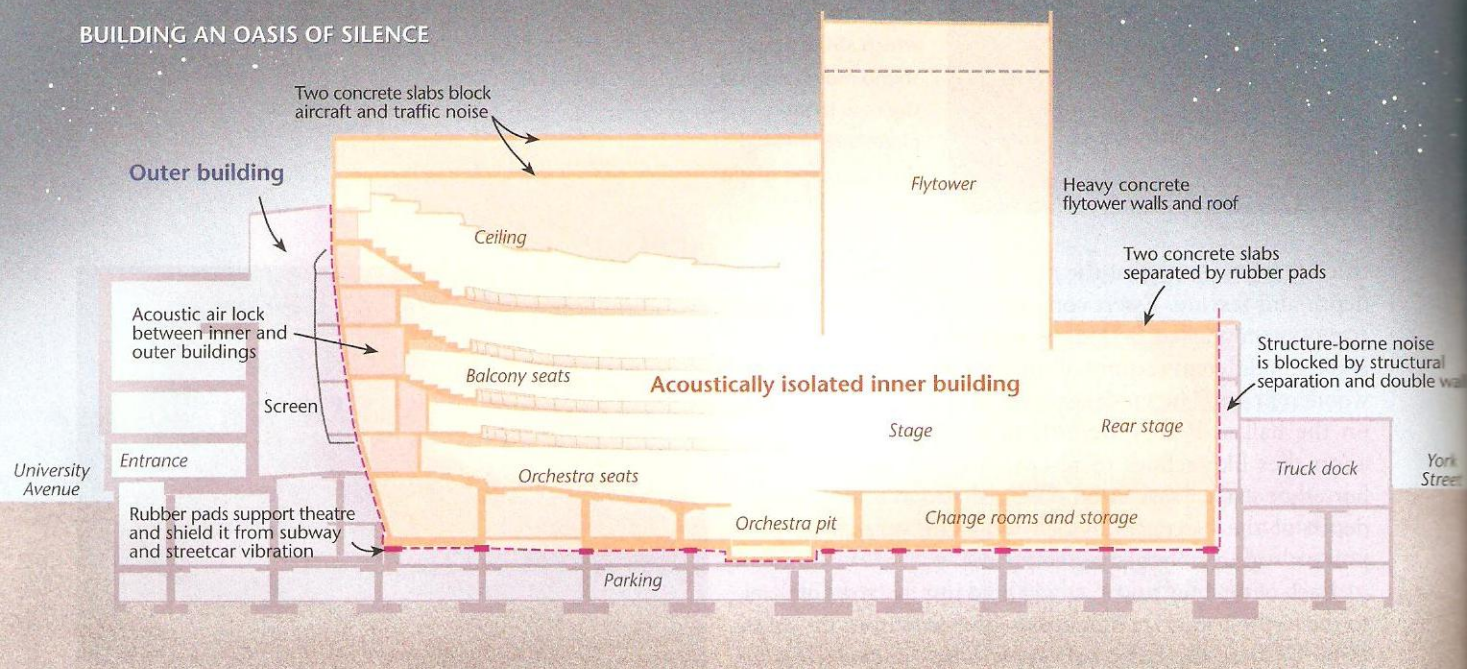
"When Handel's music was played in the Covent Garden opera house in the 18th century," he says, "he wouldn't let them dust the columns. The stucco gives us what Handel wanted."

Much of the acoustical design employed in the Four Seasons Centre follows centuries-old European conventions, but one attribute may become the building's signature: a convex plaster ceiling that will not only eliminate the echoes associated with the domed ceilings in many opera houses, but will also guide the sound to the orchestra level. Diamond insists it was more than just an acoustical innovation. As he climbs the five storeys through scaffolding to reach the ceiling, he gestures toward the workers trowelling plaster on the massive swirling forms that resemble waves emanating from an enormous pebble dropped in water. "Look," he

Each seat earns money, so Canadian Opera Company general director Richard Bradshaw (LEFT) knew that having only 2,000 seats, compared with the 3,200 in the company's current venue, would be a tough sell. "In the end," he says, "getting the acoustics right trumped every other concern."



## BUILDING AN OASIS OF SILENCE



says with near-operatic intensity, "it looks like the rings around Saturn. It's celestial."

AS THE CURTAIN RISES on opening night in September for *Das Rheingold*, the first in Wagner's monumental series, the orchestra will begin to slowly eddy 136 bars of rippling and surging musical figures in E flat — Wagner's all-encircling vision of the world's watery birth — over an eager and critical audience of opera lovers.

As the key shifts to A flat and the river maiden Woglinde begins her sensual siren song, the audience should be completely absorbed by the music and oblivious to the features of

the building. Or so Bradshaw hopes. He's worked like a Trojan to create this moment, so God forbid that any siren song other than Woglinde's — say, for example, one from an ambulance screaming past the building — should shatter Wagner's spell.

"That's not going to happen," says Bradshaw, revealing the confidence of a man atop a career conducting one of the world's great opera companies. "Not a chance."

*Paul Webster is a writer based in Toronto.*



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## A house fit for *The Ring*

Opening Toronto's Four Seasons Centre for the Performing Arts in September with Richard Wagner's *The Ring of the Nibelung*, a cycle of four operas, shows considerable ambition on the part of the Canadian Opera Company (COC). It has been called the "Everest of operas."

For Wagner, *The Ring* was intended to epitomize his concept of opera as *Gesamtkunstwerk*, or a "total artwork," in which the audience would experience beautiful singing, clear articulation of the narrative, believable acting, powerful staging, brilliant lighting, soaring orchestral performance — and superlative architectural acoustics. To ensure this perfection, he had the Festspielhaus custom-built in the Bavarian town of Bayreuth for the opera's first performance in 1876.

Wagner insisted on an unusually deep orchestra pit beneath the stage. By changing the character of the sound of the orchestra, he aimed to allow the voices on

stage more prominence. He included plaster interior walls and canvas on the ceiling to diffuse sound waves. The hall is still considered to have the best acoustics in the world for Wagner, but conductors find the orchestra pit too deep for brighter, livelier music. "You could say the best place to hear *The Ring* is Bayreuth," says COC general director, Richard Bradshaw. "But you wouldn't want to hear Mozart there."

When Russian composer Pyotr Tchaikovsky arrived in Bayreuth for *The Ring*'s first performance, his initial impressions of the venue were mostly negative. "The little town ... is not able to feed all its guests," he reported back to Muscovites in the Russian newspaper *Vedomosti*. But *The Ring* took his mind off his stomach, and he called it "an event of the greatest importance to the world, an epoch-making work of art."

Such opinions have stood the test of time. Nearly a century and a half later, good tickets for *The Ring* in the Festspielhaus typically sell out a decade in advance.

P.W.