

Breaking through the sound barrier

From being just hundreds of metres from the *Charlie Hebdo* terrorist attack to being congratulated by French President Francois Hollande for the stunning acoustics in Paris's new concert hall, it has been quite a fortnight for Auckland acoustician Chris Day. **David Lomas** reports.

NEW ZEALANDER Chris Day was in Paris for a black-tie opening. The week proved blacker than he could ever have imagined.

Just 200 metres from his hotel, two gunmen burst into the newsroom of the satirical magazine *Charlie Hebdo*, slaughtering 12 journalists, police and guests. One of Day's associates heard the gunfire.

A week later, the sound was one of rousing applause as French President Françoise Hollande entered Paris's new dramatic and controversial \$600 million concert hall, for which Day and his business partner had designed the acoustics.

Hollande opened the night with a rousing speech stating that a classical concert was in direct contrast to the terror attack and showed that Paris would not be cowed by terrorism.

"Vive la Philharmonie, vive le Paris, vive le France," he concluded.

Day, from Auckland, knew the building was special when one of Orchestre de Paris's bass players vigorously embraced him after the opening night concert.

"He just put his arms around me and gave me this huge, huge hug and said, 'Thank you for everything you have done. Tonight, I heard angels'."

The hug was the culmination of a stressful and scary two weeks for Day, which saw him within a

couple of hundred metres of the *Charlie Hebdo* terrorist attack; embroiled in a dispute over the opening of the Philharmonie de Paris, that led to the architect boycotting the event; shaking hands with Hollande; and then nervously waiting for the international reviews of the acoustics.

The bass player's praise was the forerunner of a flood of enthusiastic endorsements for the hall's radical new acoustic system, pioneered by New Zealand firm Marshall Day's co-director Sir Harold Marshall.

The *Guardian* said the €390 million (NZ\$600m) question was "what was the sound like?". The answer, reviewer Tom Service wrote, was "in short, pretty stunning". The *New York Times's* Anthony Tommasini said the acoustics "were enveloping in the best sense". And in *Le Parisien*, Severine Garnier noted that the sound "seems to descend like a bird that whirls on stage".

"The new acoustics system was reasonably radical, and pretty scary for us," Day says. "It is not a splitting of the atom breakthrough, but it is definitely a new typology that as far as we are aware has never been done before."

Marshall Day, in partnership with French star architect Jean Nouvel, whose credits include the Musee du Quai Branly and the Institut du Monde Arabe in Paris as well as concert halls in Lucerne and



Acoustic brilliance: French president Francois Hollande, centre, acknowledges the crowd as he attends the inauguration of the new Paris Philharmonic Hall, whose acclaimed acoustics were designed by New Zealand firm Marshall Day. Photo: Reuters

Copenhagen, were awarded the contract over other international contenders.

THE PHILHARMONIE de Paris had run a competition for a bold, architecturally inspiring building with an acoustic system that could not be the tried and proven "shoebox" or the "vineyard" system.

Traditional concert halls are "shoebox" designs – long rectangles in which the performers are positioned at one end and where straight, high walls reflect and blend the sound.

In the 1960s the "vineyard" design was created, with the audience on sloping terraces surrounding the orchestra, and the sound reflection enhanced by

panels. The brief for the architectural and acoustic team was to come up with a new design. Day says it was "a pretty courageous brief by the client". The acoustic requirements alone ran to 40 pages.

Sir Harold came up with his answer over lunch in Paris with Nouvel. He suggested a concert hall that in effect had two chambers – a traditional "shoebox"-style outer space and a "vineyard"-style inner space. The idea was that the sound would reflect off both spaces, giving both fast sound reflection and a slower reverberation when the sound hit the outer space walls.

Sir Harold says the concept is more than a marriage between shoeboxes and vineyards.

"What it is, is nested spaces one

inside the other." He explains that sound reflects thousands of times off surfaces.

The first early reflections are heard within a tenth of a second and come in the inner chamber. "And then there is a long tail of later reflections, getting weaker and weaker and weaker as reverberation dies away in space." These sounds come from the outer chamber.

He says Nouvel embraced the concept of two nested spaces. "He could see, of course, the great architectural possibilities."

The concept had its genesis in the Christchurch Town Hall – where "without intending to do that, we did divide the early reflected sound from the later reflected sound".



The architect: Jean Nouvel in discussion with Harold Marshall. Photo: Southland Times



Reflected glory: Chris Day, who helped design the acoustics for new Paris Philharmonic Hall. Photo: www.photobek.cz



Monolithic: the new Paris Philharmonic Hall by French architect Jean Nouvel.

ILLNESS MEANT Sir Harold, 83, was not able to attend the opening gala. That also allowed him to avoid an awkward situation, after Nouvel said he was boycotting the event and wanted Sir Harold to do so as well. Nouvel was upset that the opening was happening before the building was completed.

According to Day, who Hollande personally congratulated for the acoustic success of the concert hall, there were good reasons for Nouvel's decision. "I felt for him. The architecture externally is way from complete, and massive areas inside are still incomplete and a lot of detailing is badly done. In terms of his situation, what it looked like was terrible, and he did not want to go to an opening when his building was like that. But from our point of

view, it was 95 per cent complete." Just the hanging of curtains and some final sound tweaking needed to be done. Day says the opening gala, despite the building not being finished, was stunning. The event was dedicated to those killed in the *Charlie Hebdo* attack.

Though Day had sat through pre-opening night rehearsals, he says it was exhilarating that the first "official" sound heard in the 2400-seat concert hall was the audience's applause for Hollande, inspired by his stand against terrorism.

"It was interesting hearing the applause, because it did give an acoustic indication – to hear the reverberance, the loudness of the hall and how the sound travels around. It was a moving moment."