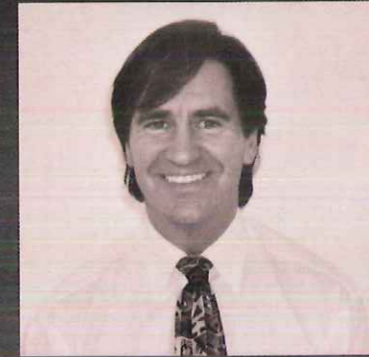


AFTER THE FALL

Three years ago tomorrow, 2800 people were murdered live on global television and the financial hub of America was turned into a smoking charnel house. Many construction experts became caught up in what happened on that day, and its aftermath. Mark Leftly, Sarah Richardson and George Hay talk to three about the disaster, the clear-up and the rebuilding

RAY CRANE



THEY HAVE DOGS TO FIND THE DEAD AND DOGS TO FIND THE LIVING. IF THE DOGS FOUND ANYTHING, THOUGH, IT WAS INVARIABLY A FINGER, THUMB OR LIMB

The engineer

Ray Crane was entitled to a morning off. The night before, the then chairman of Arup USA had hosted a dinner for executives from around the world after a presentation on the successes of the New York office.

His lie-in was disturbed by a phone call. His wife, a teacher at a well-to-do Catholic school in a New York suburb, warned him not to go into the office: downtown wasn't safe. She told him to turn on the television. The twin towers of the World Trade Centre were collapsing. She said parents of many of her pupils had been working in them.

Crane phoned his office. Several of the staff were accounted for, and ultimately all were found to be safe. This was a stroke of luck. The office was only minutes from the twin towers, and had to be shut for five days while the surrounding debris was cleared.

Arup belonged to the Structural Engineers Society of New York, which contacted its members to help clear the site. Crane's shift would last nearly 24 hours on the weekend after the atrocity. Crane describes the scene: "Nothing like this had ever happened before, the confusion was immense. It was almost impossible to get from the Structural Engineers Society office to Ground Zero.

"Thousands of people were trying to look and see. Others were trying to help, but they were in fact hindering."

The usual 15-minute walk downtown took four hours for Crane and a member of the Federal Emergency

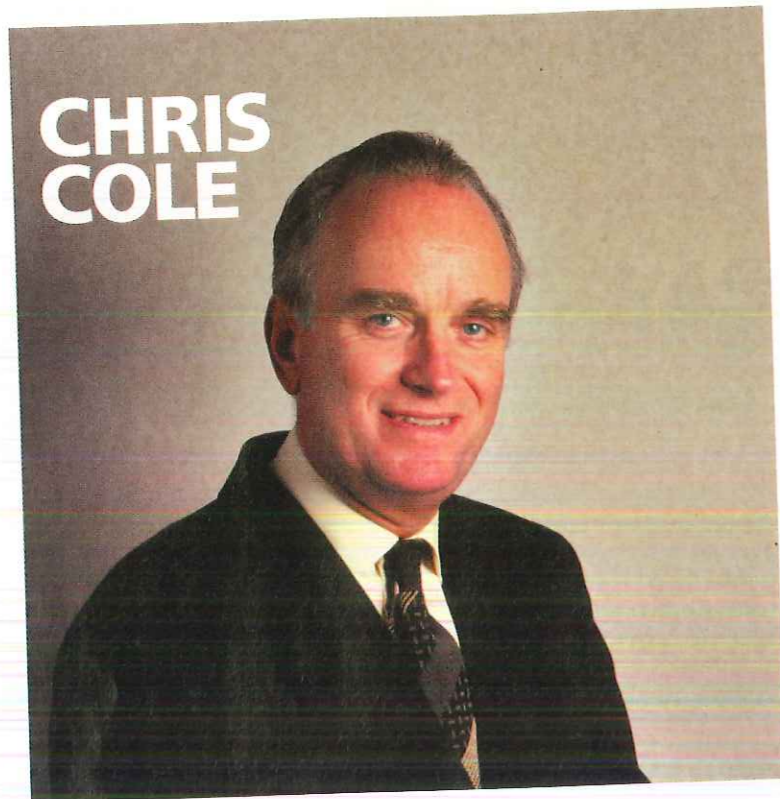
Management Agency. When they arrived, they they were given tetanus injections and told to wear gas masks. The duo had to check the rubble and see if it was safe for search and rescue teams to clamber over: "I was standing on the roof of the World Trade Centre, but I was only 15 ft off the ground," says Crane, his accent still perfectly English despite his many years in the States.

It's odd how in such situations it is the quirky details that people remember: "The alsatians sniffing around for people wore leather gloves on their feet because it was so hot. As soon as a dog smelt something they would go bananas. I never realised this, but they have dogs to find dead people and dogs to find those who are alive. If they found anything though, it was invariably a finger, thumb or limb."

As he helped clear the site, Crane was transfixed: "There was so much adrenaline pumping, it was so scary and emotional that I never batted an eyelid. Everyone bumped into each other with their eyes wide open as they were so amazed by the monstrosity of it."

When the office reopened on Monday 17 September, Arup held a memorial service. Several of those in the office had been traumatised, having viewed the attack from the roof of Arup's building.

But what Crane remembers most is the smell. "It was an acrid, fuming stench. It remained in New York for months. Even today I can smell it if I think about it."



CHRIS COLE

The design consultant

Chris Cole, recently returned from Athens' Olympic spectacle, is falling over himself for a chance to praise British gold medallist Kelly Holmes. "She was incredible," he says of the middle-distance runner. "Totally amazing." Cole is no stranger to high achievements. As chief executive of WSP, tall building specialists and design consultants on the Freedom Tower that will replace the World Trade Centre, he is at the higher reaches of the construction industry.

WSP's involvement with the 1776 ft Freedom Tower comes as no surprise. With New York's Trump Tower and Mexico City's earthquake-resistant Torre Mayor in the firm's portfolio, the company's experience of tall buildings is difficult to beat. When Ground Zero developer and long-term client Silverstein Properties was awarding contracts, Cole's company was a natural choice.

Cole is modest about the deal. "There may have been competition from rivals. You never really know that sort of thing. But," he adds quickly, "we didn't have to pitch; we got the job completely by referral."

At the time of the 9/11 attacks, WSP was involved in planning for another tower, the Barclays building in Canary Wharf (see page 46). The team had to respond immediately to ensure that the World Trade Centre's apparent structural flaws were not repeated in the UK building.

The problems Cole's team identified – issues of progressive collapse, fire protection and the weakness of a

steel core in heat – were confirmed by later studies. He believes the towers' faults were a product of its age. "People forget that the building was 30 years old," he says. "The impact of 9/11 aside, methods of design and construction have changed a lot since then."

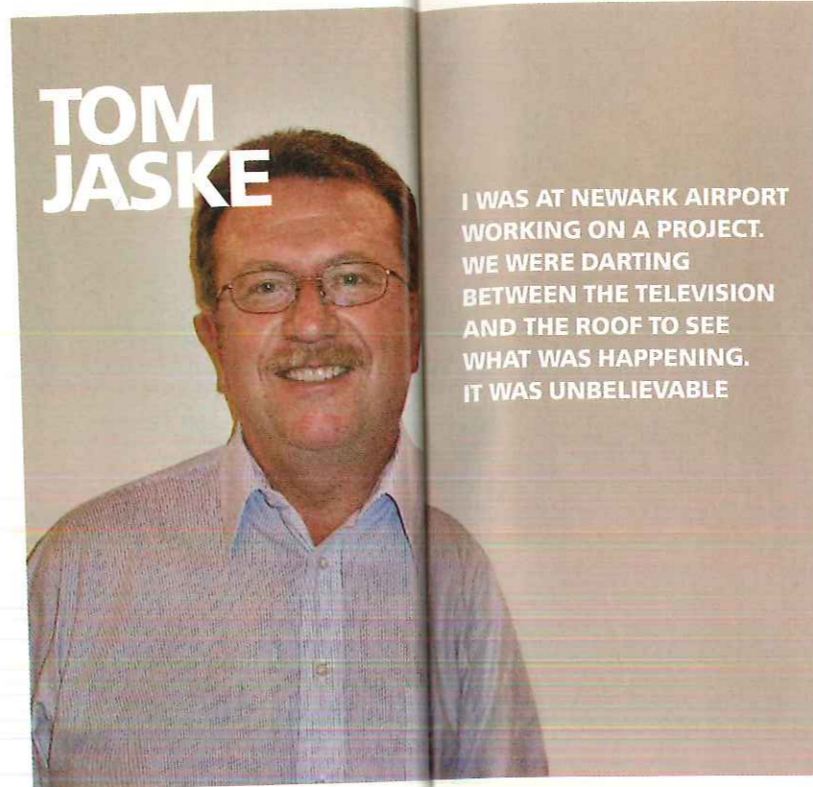
Cole believes the Freedom Tower design addresses the critical weaknesses of its predecessor. But he also stressed the need for designers to balance structural issues with an aesthetic appropriate to the building's emotive location: "The Freedom Tower should be and will be the most resilient, robust building in the world."

PEOPLE FORGET THAT THE BUILDING WAS 30 YEARS OLD. METHODS OF DESIGN AND CONSTRUCTION HAVE CHANGED A LOT SINCE THEN

But we also have to be sympathetic. We're not building a tanker".

Cole is acutely aware of the sensitive nature of his project. He was not in New York when the twin towers fell, but visited the site shortly afterwards. That experience still haunts him. "I can't think of an adjective to describe how I felt," he says quietly. "It was devastating. It left me numb. It still does. Every time you visit the site you reflect on that day."

But Cole hopes the Freedom Tower will help lay the past to rest. "America as a nation will be pleased with the tower," he says. "But I hope the families of the victims are, too. For me, that's the most important thing".



TOM JASKE

I WAS AT NEWARK AIRPORT WORKING ON A PROJECT. WE WERE DARTING BETWEEN THE TELEVISION AND THE ROOF TO SEE WHAT WAS HAPPENING. IT WAS UNBELIEVABLE

The quantity surveyor

Tom Jaske stared across the Hudson River, the fire from the wreckage reflected in the water. "I was at Newark airport working on a project during 9/11," he says. "We were darting between the television and the roof to see what was happening. It was unbelievable."

Three years later Jaske is helping to transform that scene of carnage into a symbol of US resilience. Jaske is vice president of QS Hanscomb Faithful & Gould in New York and is acting as cost consultant on the twin towers' replacement.

Like others involved in the project, it is believed that the firm accepted lower margins than is the norm when it won its two-year contract, which started last December. Jaske does not want to comment on this, but admits that profit is less of an issue on a project like Freedom Tower: "We're very proud to be a part of this; there is a certain amount of civic duty involved."

And as he freely admits, Hanscomb F&G's presence on the project is also useful for the firm's marketing strategy. Jaske often refers to it in presentations, such as the one he made this week at an international conference in Leeds, entitled "Delivering value at the World Trade Centre site".

Hanscomb F&G was appointed by the Lower Manhattan Development Corporation. There have been problems on the redevelopment of the site owing to conflicts between the ambitions of the LMDC and the those

of the World Trade Centre's leaseholder, property baron Larry Silverstein, over which architects to hire for the redevelopment and the ownership of the site.

Jaske admits that the confused aims have occasionally made life difficult in costing the project, but hints that the \$12bn (£6.7bn) price tag put on it is not too far off the mark. He adds that the interested parties are now working in greater harmony: "For the most part, the parties are now reconciled with the plans. There has been a lack of animosity."

The greatest difficulty for Jaske has not been costing the tower, but another part of Daniel Libeskind's masterplan for the site – the underground rail section. This could ultimately cost far more than initial estimates. "Given the low level of development of this part of the design, we have carried contingencies," he says. "These are not unusual percentages, but given the magnitude of the cost of the complex, it is a lot of money."

The next stage is to estimate the costs of the revised masterplan this autumn, but the practice's ambitions do not end with this contract – it is pitching to be construction manager on the demolition of the 42-storey Deutsche Bank building, which was condemned after 9/11.

"Some day soon, when Jaske looks across the Hudson, hopefully the reflection will be of signature 21st-century architecture rather than the blazing ruins of a 20th-century landmark."

What changed on 9/11?

Five building experts give their opinions



Piers Gough, architect, CZWG

I WAS IN THE EAGLE PUB IN FARRINGDON WHEN IT HAPPENED. IT OBVIOUSLY MAJORLY AFFECTED TOURISM OVER HERE. I SIT ON THE ENGLISH HERITAGE BOARD AND WHAT WITH THE FOOT-AND-MOUTH DEBACLE, THERE WERE MANY FEWER TOURISTS FROM THE USA. THE BIG ATTRACTIONS SUCH AS STONEHENGE SUFFERED QUITE A LOT, BUT EVERYTHING'S BACK TO NORMAL NOW



Dennis Lenard, chief executive, Constructing Excellence

I WAS UP IN MANCHESTER AND SOMEONE RANG TO TELL ME TO TURN ON THE TV. I SAW THE SECOND TOWER COLLAPSE – IT WAS AWFUL. WHAT I THINK CHANGED IS THAT CLIENTS STARTED TO DEMAND MORE ROBUST SOLUTIONS FOR TALL BUILDINGS. THE LARGE CORPORATIONS STARTED TO THINK TWICE ABOUT HAVING THEIR HEADQUARTERS IN HIGH-RISES. THE ICONS THAT WERE ALREADY HERE BECAME MUCH MORE SECURITY CONSCIOUS: YOU ONLY HAVE TO GO TO CANARY WHARF TO SEE THAT



Michael Ankers, chief executive, Construction Products Association

AT THE TIME, THERE WAS COMPLETE UNCERTAINTY. NOBODY KNEW WHAT EFFECT IT WOULD HAVE ON THE ECONOMY. IN THE EVENT, DESPITE 9/11, THE CONSTRUCTION INDUSTRY HAS BEEN VERY STRONG: 2002 AND 2003 HAD THE STRONGEST PERIOD OF GROWTH FOR 10 YEARS. POLITICALLY THERE HAVE BEEN A LOT OF CONSEQUENCES, BUT OVERALL THE EFFECT HAS BEEN LESS THAN WE'D FEARED



George Ferguson, RIBA president

I WAS ACTUALLY IN MY FIRST EVER RIBA MEETING AT PORTLAND PLACE WHEN I HEARD THE NEWS. I WORRIED IT WOULD CHANGE EVERYTHING FOREVER, AND IT'S ALL WORKED OUT LESS DRAMATICALLY THAN I THOUGHT. IT'S OBVIOUSLY LED TO MORE THOROUGH SAFETY REGULATIONS IN HIGH RISES, BUT TALL BUILDINGS SEEM TO BE AS POPULAR AS EVER. I THINK THE MAIN DIFFERENCE IS THAT AFTER 9/11 YOU CAN NEVER TALK IN TERMS OF MAKING TALL BUILDINGS SAFE, JUST SAFER



Ken Dytor, chief executive, Urban Initiatives

WE WERE PUTTING TOGETHER TWO MAJOR FUNDINGS AT THE TIME, AND I WAS SURE THEY WERE GOING TO BE AFFECTED. IN THE EVENT THEY WEREN'T AT ALL. 9/11 CERTAINLY HAD A MAJOR IMPACT ON THE CENTRAL LONDON ECONOMY AND TOURISM, THOUGH

