

# More education please – CSM-style

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I RECENTLY returned from three days at the Colorado School of Mines (CSM), in Golden, US, having had the good fortune to have been accepted onto the 'Breakthroughs in Tunnelling' short course (see page 24).

In the past, I have to admit often having felt a sense of anti-climax at the end of courses, mainly disappointment at the insubstantial nature of what was on offer. Did I really learn anything, I would ask myself?



But I have no qualms in giving a plug to the CSM tunnelling course as probably the best educational course I have ever attended. Why?

First, its vast array of subject matter gave a good snapshot of where we are in tunnelling, presenting the advances and updates, scope

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and possibilities. Second, some of the most respected names in international tunnelling gave the presentations. And third, the course was well organised and furnished with good documentation.

We need more courses like this.

Although tunnel conferences involve paper presentations, they are not 'courses' as such. Simultaneous presentations make it difficult to attend the papers you want to – and those you do attend can be difficult to follow due to poor language/presentation skills – and dividing time between conference and exhibition can be difficult.

Attending a dedicated tunnelling course is a much better bet if you are seriously into continuing education. But you shouldn't have to travel thousands of miles for it. Which is why we need more CSM-style tunnelling courses in Europe and elsewhere, not only as a means of continuing education, but also as a way to attract more people into tunnelling.

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*Installing diaphragm wall reinforcement for the cut and cover sections of the second Tyne Tunnel, currently under construction in north-east England. The portion of tunnel beneath the River Tyne will be a four-section immersed tube. See pages 26-28. Photo: Lansdowne Photography.*

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# Breakthrough at tunnel school

George Demetri blazed a trail to the foothills of the Rocky Mountains in Colorado where he was fortunate to be allowed on to a comprehensive tunnelling course

**H**OW do you increase your knowledge of tunnelling in as short a space of time as possible and keep up with the latest developments? One answer is to attend the Colorado School of Mines' (CSM) tunnelling short course. Now held annually, this year's 'Breakthroughs in Tunnelling' was held on September 23-25 at the CSM campus in Golden, located around 13 miles west of Denver, Colorado.

The curriculum includes aspects of conventional and mechanised tunnel design and construction in hard rock, soft ground and soils. It covers site investigations, geotechnical baseline reports and risk assessments, ground support, NATM design, hard rock TBMs, slurry and EPB shield machines and much more.

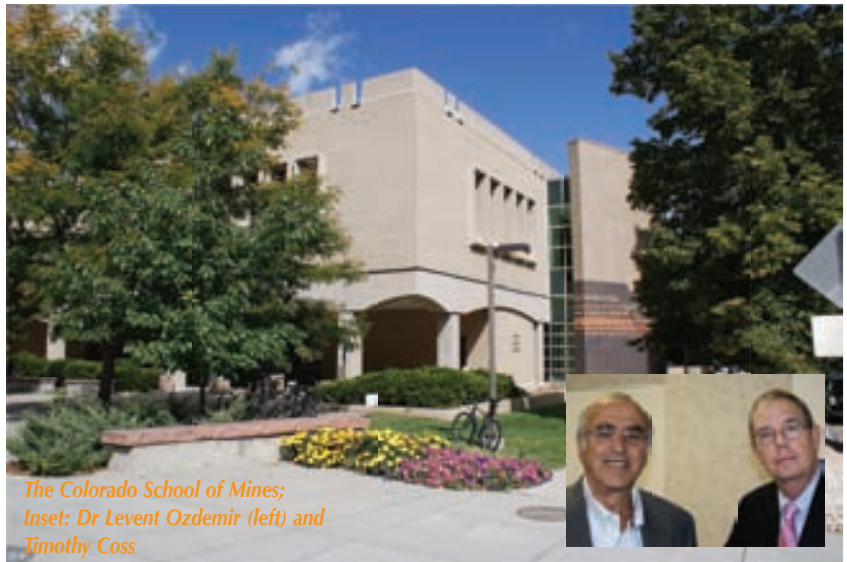
According to the organisers, the aim is to create "in-depth, specialised instruction that is not offered anywhere else in the world" in order to attract a wide range of technical and management professionals – from engineers to contractors and owners to consulting companies.

Established in 1874 as a mining school during an era when Denver and the areas to the west were experiencing a spate of either real or illusory goldrushes, the school has gained international recognition as a centre of excellence both in mining and tunnelling. This year it has increased its intake by over a third to more than 4,000 full-time students spread over 14 departments.

Prospective students thumbing through the three-day schedule of Breakthroughs in Tunnelling might have been forgiven a slight trepidation at the number of lectures and the incredibly wide spectrum of subjects to be presented in the short space of time.

But the reality was more a steady progression through many of the important issues in tunnelling. With lectures starting at eight in the morning and finishing after 5pm, it is difficult to see how the organisers could have shoe-horned any more into what turned out to be three worthwhile, action-packed, educational days. This in part was also helped by the A-list of authoritative, expert presenters that included some renowned international tunnelling personalities.

Although attendees were mostly from the US, there was also a sprinkling of people from China, Taiwan and the UK. However, the school aims to attract more international students in future years, which should not be difficult given that the tunnelling course is more or less unique.



*The Colorado School of Mines;  
Inset: Dr Levent Ozdemir (left) and  
Timothy Coss*

In only the second year of its existence, the course is under the direction of Dr Levent Ozdemir, professor of mining and director of the CSM's Excavation Engineering and Earth Mechanics Institute (EMI). Having gained a PhD from the school in 1975, Ozdemir stayed on to work for EMI, where he undertook research into hard rock mechanised tunnelling. He became EMI's director in 1981 and retired in June after 32 years of teaching and research at CSM.

Professor Ozdemir says: "Since 1990, I had been organising a one-day tunnelling course that was held annually at the RETC and NAT events. These proved very successful and generated more demand, as a result of which we increased the duration to three days and gave the tunnelling short course a permanent home at CSM. This is only the second year of the three-day course, which will now be held every September."

Since his retirement, Ozdemir has advised on numerous tunnelling projects both in the US and abroad, including the first tunnel ever built (now in place) beneath the Bosphorus in Turkey, and also the 3.3km-long, 13m-diameter Istanbul Straits Road Tunnel, which will be constructed by a JV of Turkish and Korean firms.

The tunnelling short course follows the tried and tested format of the School's microtunnelling course that has been running for 17 years under the direction of Dr Ozdemir and Timothy Coss, president of Microtunnelling Inc, based in Boulder Colorado. The microtunnelling course

has attracted over 1,700 students from 25 countries. Coss is also a co-director on the tunnelling course and like Ozdemir, is widely recognised in the tunnelling and microtunnelling sector.

So how did Breakthroughs in Tunnelling go down with the 126 students who packed the lecture theatre? Judging by their reaction and enthusiasm, the course was undoubtedly well-received by the majority; the lack of 'drop-out' so often seen on courses and the full lecture theatre almost right to the end indicated how respected the course has become.

Some students, this author included, felt the event might have better been spread over four days instead of three, but this, according to Ozdemir, would not strike the right balance. "We have found that anything over three days is too long and two days is too short," he says.

Perhaps a visit to an on-going tunnel project would have crowned a very successful three days. Unfortunately, Golden's relatively remote location makes this logistically too difficult and would no doubt increase the US\$1,500 cost of the course.

None of this detracts from what was a well-organised and worthwhile event, which next year will be held on September 22-24. By then, the school might need a larger lecture theatre.

*The editor is grateful to Prof Ozdemir and CSM for facilitating this visit*