

XXXV IULTCS Congress 2019

The XXXV Congress of the International Union of Leather Technologists and Chemists Societies (IULTCS) took place in June in the city of Dresden, returning to Germany after 29 years. World Leather reports on some of the keynote speeches and interesting developments that were presented during the four-day event.

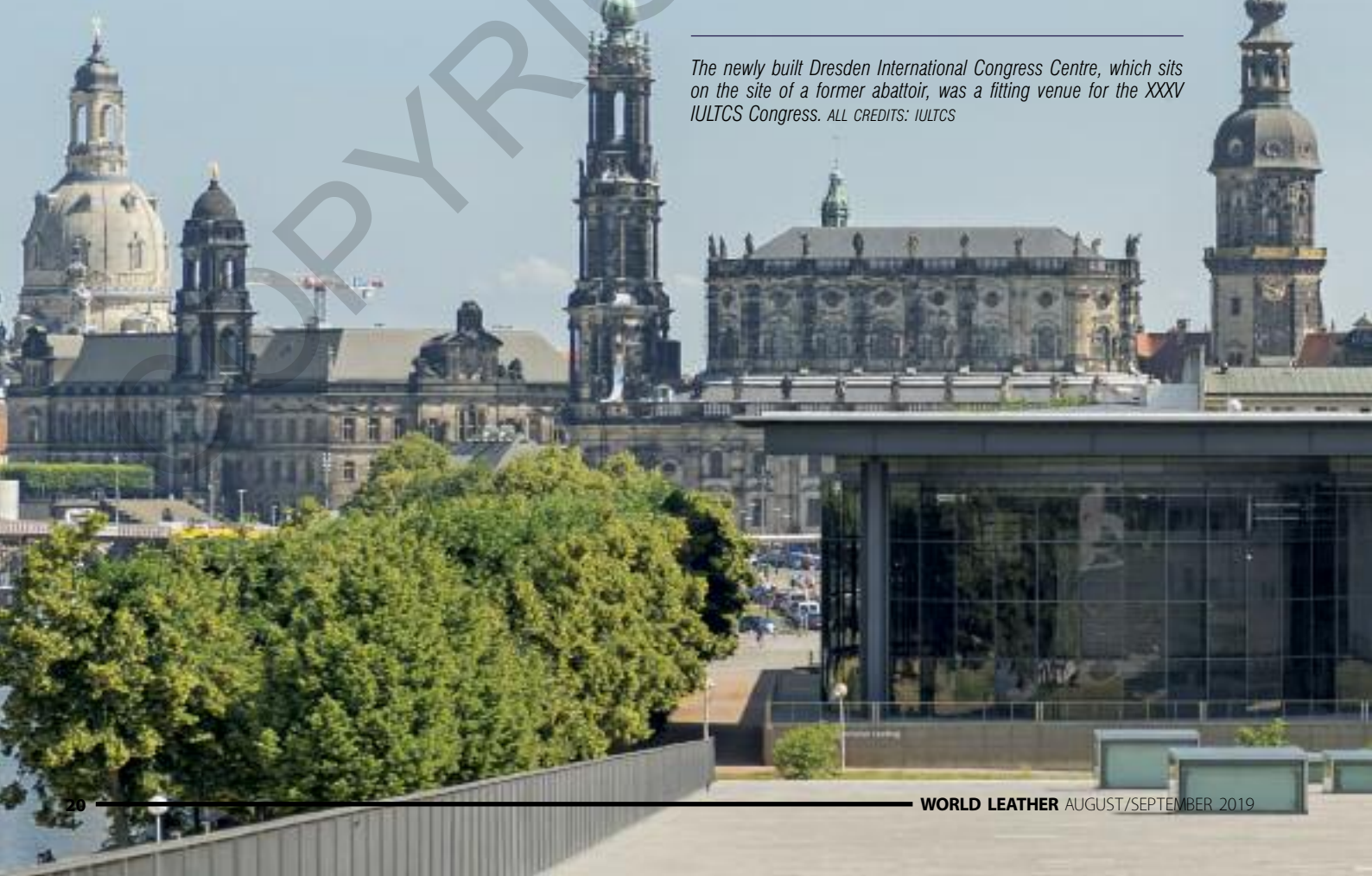
The XXXV IULTCS Congress held in Dresden, in June attracted almost 450 attendees from 28 countries. A total of 71 lectures were given during the four-day event and a total of 101 poster displays were shown. In a welcoming address, Congress president Dr Dietrich Tegtmeier emphasised the theme of the event, that leather is "benign by design". The opening session also had speeches from the vice-president of Germany's leather chemists' society, VGCT, Dr Beate Haaser, and from political figures. The speeches, interspersed with musical passages courtesy of players from the Dresden Youth Orchestra, led to the presentation of the IULTCS Merit Award to Jakov Buljan.

Mr Buljan received the award in recognition of his efforts to promote leather technology, chemistry and science on a worldwide basis over many years. Mr Buljan completed a degree in biochemistry at the university of Zagreb in 1966 and spent his entire professional career in the leather industry. He remained in Croatia at first, working for sheep and goat leather producer Cibalia, introducing important innovations in drying and milling during his time there to improve output and quality. He went on to

hold senior management positions, including at a tannery in India, set up with Cibalia as a joint-venture partner in 1974. In 1983, he went to Vienna to work on leather projects at the United Nations Industrial Development Organisation (UNIDO) and remained there until his retirement in 2003. During his two decades at UNIDO, Mr Buljan launched initiatives with the emphasis on environmental issues. He led 50 projects to establish effluent treatment plants in developing countries. He also organised and delivered UNIDO training workshops in many countries and was a frequent contributor of technical articles to *World Leather*. In his acceptance speech, Jakov Buljan expressed how honoured and humbled he was to receive the award. He stated that he was fortunate to interact, to co-operate was "too strong a word", he insisted, with figures such as Eckhardt Heidemann, Robert Sykes and learned much from them. "My achievements are their achievements," he said.

Flowing logically from this, the opening presentation of the congress was the Heidemann Lecture, entitled 'As tough as Leather: Macro to Nano scale perspectives of Collagen Stability'. This was presented by Professor

The newly built Dresden International Congress Centre, which sits on the site of a former abattoir, was a fitting venue for the XXXV IULTCS Congress. ALL CREDITS: IULTCS





Kheng Lim Goh from Newcastle University, Singapore. Professor Goh showed how the most important function of collagen is a mechanical one and that findings from recent studies on the mechanics of collagen in connective tissue could enable structural biologists to complete their understanding of its functional significance. This understanding could then direct the development of new technology such as leather design and production. The conventional understanding of the collagenous fibre-like structures – embedded in an hydrated ground substance that is macromolecule-rich in proteoglycans and glycosaminoglycans – in connective tissue finds an analogy to engineering fibre-reinforced polymers such as carbon-fibre-reinforced composites. The paper took a fresh look at the degree of collagen fibril alignment in tissue and reconsidered the mechanics of crosslinking between fibrils.

The first keynote lecture, entitled 'Sulfide unhairing: rethinking the received wisdom', covered work carried out by the University of Northampton's Institute for Creative Leather Technologies and was presented by Dr William Wise. The practice of removal of hair from hides or skins by dissolving it with a mixture of lime and sulfide came into question. The 'theory' is that the sulfide (S^{2-}) attacks the cystine disulfide linkages in the keratin. With recent studies providing substantive proof that the S^{2-} species does not exist in aqueous media at any pH, there is obviously a contradiction with the currently accepted mechanism. Whilst unhairing is clearly a pH-dependent process and the mechanism must still include the breakdown of the disulfide bond, it is possible that new reaction mechanisms can be postulated but, as yet, processing adaptations need not be a concern.

On day three, the organisers incorporated the Freiberg Leather Days conference, which takes place each year

hosted (usually) in Freiberg, near Dresden, into the IULTCS Congress. Sessions were split into two, with separate scientific and engineering sessions. In the first engineering session, Manuel Bruder from Expert Systemtechnik examined the relationship between technology and humans in operations such as detecting defects on a hide. Since 2011, Expert Systemtechnik has been working on its Scan Expert Automatic+ automated defect detection system and has come up against the challenges that this presents. Defects such as veins, insect bites, growth marks or processing damage can be easily identified in time with the human eye, but with automation this ought to be faster and more reliable. The company has developed a system of colour-independent 3D surface reconstruction, using more than 50 algorithms and artificial intelligence. With this, and with machine learning, the system explores the possibility of implementing individual customer requirements for quick and flexible qualification.

A novel approach to chrome reduction in chrome-containing wastes was discussed by Eser Eke Bayramoglu from Ege University in Turkey. Through the use of oyster mushrooms (*pleurotus ostreatus*), which can easily develop and grow on chrome shaving waste, she said it is possible to mineralise and absorb a certain amount of chrome into the mushroom body, with findings that mushroom yield actually increased due to nitrogen existing in the leather waste.

In an attempt to allow more presentations, this year saw the introduction of a set of 'Speed Science' lectures. A series of three-minute presentations were given, one after another where no questions were asked afterwards but

*Left to right: Dietrich Tegtmeier, Jakov Buljan and Thomas**Almost 450 delegates from 28 countries attended the event.**Sessions split on day three, offering science or engineering as themes.**In total, the programme included more than 70 talks and keynote speeches.*

interested parties were encouraged to visit the presenter's poster display in the exhibition hall afterwards. In total, three separate sessions gave 16 presenters the chance to show their work. These included presentations on closed-loop systems for liming and tanning, a review of scientific and technological literature of fungicides in the tanning industry, adsorptive removal of sulfate, phosphate and chloride from aqueous solutions and the use of different pretreated chromium leather shavings to produce biogas.

One of the final presentations was titled 'Sustainability 4.0 – The passport to our future', presented by Dietrich Tegtmeier of Lanxess. The premise of this presentation was that under the current linear economy model, the increasing resource consumption cannot be continued. He pointed out that Earth Overshoot Day – the day when the world begins essentially borrowing resources from our planet which nature cannot replace or renew in one year – was August 1 in 2018 and July 29 this year and means we are stealing resources from future generations. In his talk, Dr Tegtmeier went through the four phases of sustainability leading to the current position. After the industrial revolution, it was not until the 1950s and 60s that wastewater treatment plants were introduced as a barrier between industrial operations and fresh water – this was phase one. Phase two was the beginning of global sustainability governance. In 1983, the UN World Commission on Environment and Development brought out the Brundtland Report, proposing the idea of a

triple bottom line benefiting people, planet and profits. Phase three was when the concept finally achieved global reach, with the Rio Summit of 1992 and the Kyoto Protocol of 1997. Phase four – the millennium phase – addressed the climate dimension and social responsibilities as main topics.

In context, the leather industry should adopt a Tannery 4.0 concept and focus on the recycling of tannery residues as well as reworking them into tanning, retanning or finishing chemicals for direct use in tanneries as well as for other upstream applications, according to Dr Tegtmeier. There should also be outlets for other residues as raw materials for options such as fertiliser or animal feeds. Turning the linear economy into a circular economy and the use of clean energy in production are becoming the two most important industry trends for the coming decades.

Other topics including the EU-funded Life Biopol project (covered in *World Leather* February-March 2019), VOC reduction, the environmental impact of leather chemicals, and fine hair on American bovine leathers, to name but a few.

The congress also included a walking tour of the city of Dresden, a dinner cruise along the River Elbe and a gala dinner held on the final night. The IULTCS Congress flag was handed to Dr Mwinyikione Mwinyihija, executive director of the African Leather and Leather Products Institute, who will host the XXXVI IULTCS Congress in Addis Ababa, Ethiopia, in 2021. 🌐