

## INTERNATIONAL TEPHRA CONFERENCE “CROSSING NEW FRONTIERS: TEPHRA HUNT IN TRANSYLVANIA”, 24 JUNE – 1 JULY, 2018, MOIECIU DE SUS, ROMANIA

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The International Focus Group on Tephrochronology and Volcanism (INTAV) held an international tephra conference, “Crossing New Frontiers: Tephra Hunt in Transylvania”, at the spectacular mountain resort ‘Cheile Gradistei’ Fundata near Moieciu de Sus (Fig. 1), about 30 km southwest of the regional city of Braşov, in the southern Carpathian Mountains of Transylvania, Romania, from 24 June to 1 July, 2018. INTAV (which has operated previously under various names including COT, SCOTAV, and ICCT) is a global tephra research group active within the Stratigraphy and Chronology Commission (SACCOM) of INQUA since its initiation in 1961 (Kobayshi, 1965; Westgate and Gold, 1974; Lowe et al., 2011). It organises specialist tephra meetings every four years or so on average, although the most recent meeting (before this one in Romania) was held in 2010 in Kirishima, Japan (Holt and Lowe, 2010). The Romanian tephra meeting was convened by Daniel Veres (Romania) and Ulrich Hambach (Germany), together with support from the INTAV executive committee of Britta Jensen (Canada), Peter Abbott (UK/Switzerland), Takehiko Suzuki (Japan), Siwan Davies (UK), and David Lowe (New Zealand).



**Figure 1.** View of spectacular landscape encompassing the conference venue, ‘Cheile Gradistei’ Fundata, which is near the village of Moieciu de Sus in the southern Carpathian Mountains in Transylvania.

(Photo credit: all photos by David Lowe unless stated)

**Figure 2.** Participants eagerly awaiting a keynote talk.



By all measures, the conference must be judged a tremendous success, helping to advance most of the objectives of INTAV's underpinning EXTRAS project (*EXTending tephRAS as a global geoscientific research tool stratigraphically, spatially, analytically, and temporally*), and allowing insight into much of the really excellent research being undertaken in Romania and nearby countries. As well, the special venue and the way the conference programme was constructed provided great opportunities for discussion, networking, and interactions between the wide range of participating researchers. Not least, the conference was a success because of the warmth, friendliness, and helpfulness of the hosts at the venue and during the field trips: no stone was left unturned by Daniel Veres and Ulrich Hambach, and their friendly student and postdoctoral helpers, to ensure that all participants felt welcome and well looked after for their entire stay in Romania.

**Figure 3.** Participants in front of columnar basalt in the Perșani volcanic field (active from 1.2-0.6 Ma) in the southern Carpathians during the mid-conference field trip. (Photo credit: Pierre Oesterle).



The conference also featured, notably, strong contributions in volcanology as well as many papers representing the explosion of research on cryptotephra in a range of environmental settings, and on new methods for detecting and analysing them including the use of X-ray fluorescence core scanners (such as ITRAX) and computed tomography (CT) imaging, new methods for analysis including trace element mapping of small glass shards using multiple line scans with LA-ICP-MS, new dating applications, and a number of novel applications of tephra deposits that are best described as 'beyond isochrons' in the words of Dugmore and Newton (2012).

The meeting involved 92 participants (Fig. 2) – a record number for an INTAV meeting – from 20 countries (76 participated in the Kirishima meeting in 2010). The greatest numbers were from the UK (24), Germany (14), Romania (7) and the USA (5) with up to four representatives from each of Denmark, Russia, Norway, Sweden, Canada, Italy, Switzerland, Turkey, Japan, China, Poland, Serbia, Hungary, Singapore, Iceland, and New Zealand. The total included 22 students, with 17 of these undertaking PhDs. On the basis of these participatory figures, and ignoring many other factors such as travel distances, it is indeed interesting to reflect that (crypto) tephra studies are so very strong in the UK especially.

The interest in general in such studies is shown by the remarkable increase of published papers on cryptotephra in the past decade (Lane et al., 2017).

Participants were treated to 94 stimulating papers, including 41 oral papers in seven sessions and 53 poster papers presented in three sessions. All the poster papers remained on display for the entire conference so they could be viewed at times other than during the dedicated sessions. Seven outstanding invited keynote presentations were made, one in each oral session, by Sabine Wulf (UK), Michael Sigl (Switzerland), David Karátson (Hungary), Caroline Bouvet de la Maisonneuve (Singapore), Maarten Blaauw (UK), John Westgate (Canada), and Vera Ponomareva (Russia). A special evening lecture was given by Ioan ('Nino') Seghedi (Romania) entitled "Geological and volcanological outline of the Carpathian-Pannonian region with emphasis on the Romanian territory", which summarised the complex regional geological setting and very active tectonism as well as local volcanism in the southern Carpathians. The presentation helped to set the scene for the one-day mid-conference field excursion in the region (and the later post-conference excursion). The mid-conference trip was led by Ioan Seghedi, Daniel Veres, and Ulrich Hambach (Seghedi et al., 2018) and included a visit to the basaltic Perşani volcanic field (Figs. 3 and 4) and a very popular viewing of Dracula's castle in Bran at the end of the day (Fig. 5).

The conference abstract volume is available at the conference website (Hambach and Ulrich, 2018). Many papers arising from the conference are to be assembled into a special tephrochronology volume of *Quaternary International* (in preparation).

The conference was supported financially and in kind by a number of sponsors (all listed in the programme and abstracts volume and on the conference website) and an INQUA grant (1710P) of €4600 obtained by INTAV through SACCOM (supported by commission president, Mauro Coltorti). The INQUA grant was used to help 18



#### From top:

**Figure 4.** A New Zealand connection: small group photographed in the Perşani volcanic field who have worked, or are working, in New Zealand. From left: Leonie Peti (University of Auckland), Maria Gehrels (York University), Ola (Aleksandra) Zawalna-Geer (University of Exeter), David Lowe (University of Waikato), and Jenni Hopkins (Victoria University of Wellington).

**Figure 5.** Bran (Dracula) Castle, Transylvania, visited during the mid-conference excursion. Not far from the conference venue, the castle in Bran was completed in 1388 AD.

**Figure 6.** Ten of the 18 happy ECR and student recipients of INQUA travel grants.



**Figure 7.** Maarten Blaauw (right) leading the age-modelling workshop for around 25 participants.



**Figure 8.** The winners and runners-up for best student oral and poster papers. From left, Jayde Hirniak, Jennifer Saxby, Hannah Buckland, and Ali Monteath.

**Figure 9.** Esther Ruth Gudmundsdottir (Iceland) receiving the INTAV Honorary Life Member certificate on behalf of Gudrun Larsen (Iceland) from INTAV president Takehiko Suzuki.



early career researchers (ECRs) and students to travel to the meeting (Fig. 6). Most were from within Europe (14) but four travelled from beyond Europe including several from as far away as New Zealand.

Another feature of the conference was an excellent Bayesian-based age modelling workshop (Fig. 7) led by Maarten Blaauw (UK) following his insightful keynote paper, “More dates and use Bayes – recommendations for robust age-depth models”. Maarten’s presentation is available on the conference website. Steve Kuehn (USA) reported on progress on the development of the INTAV global database project and provided new updated protocol sheets for evaluation by tephra community in the next few months.

Four students were awarded certificates and cash prizes (sponsored by the University of Waikato, New Zealand) for first and second places in poster and oral presentations (Fig. 8). As noted by the judges, the standards of

presentation were uniformly high throughout the conference and so their job was a difficult one.

A number of awards were presented at the conference dinner, which also featured traditional Romanian dancing and music. Two INTAV Honorary Life Memberships were awarded to Gudrun Larsen (Iceland) (the award was received on Gudrun's behalf by her colleague Esther Ruth Gudmundsdottir; Fig. 9) and to (a surprised) David Lowe (New Zealand). Their achievements in tephrochronology were described in brief by Andrew Dugmore (UK) and Peter Abbott, respectively. Only 14 such awards have been made internationally since they were instigated formally about 20 years ago by INTAV. John Westgate (Canada) was awarded, to universal acclaim, a special framed certificate to mark the 50<sup>th</sup> anniversary of the publication of his pathfinding paper (with the late D.G.W. Smith) in 1969 on the use of the electron probe to characterise glass shards in tephras to enable them to be correlated over long distances (Figs. 10 and 11) (Smith and Westgate, 1969). The venue hosts also baked a commemorative chocolate layer-cake to mark the occasion (Fig. 10).

On the last day of the conference, a business meeting was held by the executive of INTAV at which the future of INTAV as a global tephra community was discussed, including possible roles in INQUA and IAVCEI or as a stand-alone organisation (see Lowe et al., 2018, pp.3-4). The forthcoming INQUA congress in Dublin (2019) was also noted, in which four sessions relating to tephrochronology are currently open for abstracts.

The conference was followed by a compelling three-day post-conference field trip involving 32 participants. It was led by David Karátson, Daniel Veres, and Ulrich Hambach (Karátson et al., 2018) along with student/ECR helpers. The excursion, which ended in Bucharest, included a visit to a huge and impressive underground salt mine at Slănic; proximal rhyolitic and dacitic tephra deposits, domes, and craters; the mountainous impacts of dynamic and complex tectonism; beautiful monasteries, churches, walls and castles and other buildings from Romania's rich history; loess encompassing distal tephras and paleosols on the Wallachian plains (Figs. 12 and 13); landsliding landscapes; and spectacular mud volcanoes (Fig. 14).



#### Above from top:

**Figure 10.** Certificate and special chocolate (layer) cake prepared to commemorate the 50<sup>th</sup> anniversary of the publication of John Westgate's pioneering paper (with D.G.W. Smith) in 1969. From left, Takehiko Suzuki, Cora and John Westgate, Britta Jensen, Peter Abbott, and David Lowe.

**Figure 11.** The special commemorative certificate presented to John Westgate (to learn more about John's extensive and pathfinding contributions to tephrochronology, see Froese et al., 2008). The SEM images of glass shards (provided by Britta Jensen) represent the North American tephras that John analysed in undertaking his seminal research.

#### Opposite from top:

**Figure 12.** Loess section supporting Mollisols on the Wallachian plains in southeast Romania alongside the Buzău River. At the base is a thick distal tephra (~0.5 m), the Y5 tephra (Fig. 11) associated with the Campanian Ignimbrite eruption c. 39-40 ka in the Campi Flegrei field, Italy.

**Figure 13.** The darker-tinted Y5 tephra, about 0.6 m thick, seen here alongside Dan Veres.

**Figure 14.** Top of a mud volcano in a natural reserve at Berca belching mainly methane derived from deposits ~3 km below. In the background are hills that have been subject to very fast rates of mass movement (landsliding).



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