Estonian Journal of Earth Sciences, 2012, **61**, 4, 193–194

Anniversaries provoke interest in lessons gained from history

This special issue of the *Estonian Journal of Earth Sciences* (*EJES*) is dedicated to the 65th anniversary of the Institute of Geology at Tallinn University of Technology (IG), an institution founded at the Estonian Academy of Sciences in 1947. In that context we also note the 75th anniversary of the Geological Survey of Estonia (GSE) that was established ten years earlier, in June 1937. Then the Estonian Geological Committee was created, which served for three years as the first geological survey. Despite the shortness of the first appearance, thanks to some continuity on personal basis the GSE was re-established in August 1957 through a number of interim transformations as an organization under the government of the Estonian SSR. In more detail the history of the GSE is treated in a review by Vello Klein, former director of the GSE (Klein, V. 2012. 75 years in footsteps of the Geological Survey of Estonia. *Eesti Geoloogiakeskuse Toimetised*, 11, 5–14 [in Estonian]). Celebration of these memorable dates provoked a closer look at the history of geological research and publication of several review books by both institutions (for the GSE see the above paper by Klein 2012). The history book of the IG, *Institute of Geology. Sixty-Five Years of History: Founding and Changes, People and Science, Recollections and Aspirations* (Aaloe, A., Heinsalu, A. & Kaljo, D., eds, 2012), written in Estonian with the English summary, is in press now. In addition, the present special issue of the *EJES* publishes a set of current research results by members of the institute and their colleagues from elsewhere. Below, we will give a brief overview of both publications with some general comments.

The IG history book presents a retrospective review of the activities of the institution and its members over the last 65 and more years. This was a rather complicated period for Estonia and its people – years after World War II, development of the Soviet Union from Stalin's to Gorbachev's times, independent Estonia, its market economy and science reform. These are only a few key words marking the essence of the main stages of history related to the story here.

The history of geosciences is generally subdivided into two main periods. The first period, a pre-scientific time of accumulating knowledge through experience about minerals and rocks needed for life (tools, building materials, etc.), lasted for nearly 10 000 years in Estonia (beginning with the appearance of humans representing the Kunda culture in 10–11 ka BP). The second period, the development of scientific geology, is still pretty short. Its conventional beginning was linked to the reopening of the University of Tartu in 1802, although the first publications describing geological objects in Estonia appeared much earlier (in 1678). The Mineralogical Cabinet, founded at the University of Tartu in 1820, became the first geological institution on the present territory of Estonia and the university remained the single scientific establishment engaged in geology for more than 100 years. During the first Estonian Republic, the exploration of mineral deposits was mainly the duty of the Mining Board at the Ministry of Economics, and only in 1937 a special institution for applied geology was founded – the GSE as mentioned above. An Institute of Natural Resources, established at the same time, was designed for the study of the properties of useful minerals, as well as for the development of their utilization technologies. Both institutions were soon closed by the arrival of Soviet authorities in 1940, but importantly, part of their personnel was later (1944) employed in a sector of useful minerals of the Central Institute of Scientific Research of Industry of the Estonian SSR. Three years later this sector became a primary nucleus of the IG of the Estonian Academy of Sciences.

Although the commencement of activities of this new academic institute in 1947 did not bring along any immediate changes in science or applied research in geology, it was still an essential event in science policy. This was the first time that an institution with strong ambition to advance scientific geology outside the universities appeared in Estonia. Later history has testified that further progress in geosciences, during the Soviet period in particular, occurred mainly due to the efforts of this institute.

Further development of the IG is described in the four parts of the book as follows. (1) History: chronicle of events, predecessors, establishment of personnel and structure. (2) Infrastructure: location, buildings, field stations, laboratories and collections. (3) Research: main trends, results and applications in six main fields – Precambrian geology, Palaeozoic geology, Quaternary geology, postglacial geology, isotope palaeoclimatology and meteoritics. (4) Personal recollections. Four annexes list administrations in between 1947 and 2007, dissertations defended by the members of the IG, a list of awards received and a list of IG employees from 1947 to 2011.

Summarizing the main evolutionary trends in the history of the institute, we should note two big 'problems' that have been topical for many years and were relevant not only to the IG: (1) determining the 'right' proportion of fundamental and applied research in an academic institution and (2) securing a qualified rising generation for the sustainable future of research. Both lines have had ups and downs, but let us mention a few most memorable episodes. N. Khrushchev, leader of the USSR, got an idea to 'bring geosciences closer to the needs of people'. It liquidated academic geology in Latvia, Lithuania, etc., but was not supported in Estonia and we continued in the framework of the Academy of Sciences. An opposite crisis concerning applied research was created during the science reform in the 1990s by a Swedish group of experts. Still, we accepted that, in principle, the evaluators pushed us in the right direction – we found that the extremes are farther off from the truth than the midway. During the last decade, the personnel of the IG has been ageing rather quickly, posing a risk to the future of the institute. The primary reason for such a situation is rooted in the new legislation (1994) that permitted postgraduate studies only in university institutes and not in those of the Academy of Sciences. This surely was a political decision, made despite the fact that these studies were highly efficient in the Academy. A good example is the science personnel of the IG, whose PhD degrees in a majority of cases were achieved in the Academy of Sciences.

Geology is a relatively small field of knowledge in a very wide and diverse group of natural sciences, but we still have certain positive relationships that arise from useful minerals and links to the economic development of the country. We have high regard for co-operation with not only applied geological and environmental institutions, but also with various industrial establishments, who make use of geological knowledge. The Estonian science policy is oriented to excellence and the IG is pursuing the same, which, of course, should not mean neglecting applied research. In this context we as representatives of the geological science are worried about ever decreasing potential of the GSE to have a positive influence on geological policy and on sustainable use of minerals, including protection of reserves in the framework of general nature conservation. There is no need to look for any subjective faults, but the trend should be changed by restoring the governmental position of the GSE and its corresponding functions as soon as possible.

The special issue of the *EJES* contains papers covering a full range of topics reflecting current developments in geological research in the IG. Papers on the early Palaeozoic and Holocene biostratigraphy, palaeontology and palaeogeography, which are traditionally the most successful fields in the IG research, prevail, but also innovative pieces of studies in Precambrian and isotope geology, in geochemistry and hydrogeology are included. For example, K. Ehrlich et al. discuss the crystallization temperature regime of the Proterozoic volcanic rock samples from Suursaari Island, Gulf of Finland, using the Ti-in-quartz method. The authors assess that the temperature was in the range of ca 650–740 °C.

O. Hints et al. discuss an integrated Middle Ordovician conodont–chitinozoan biostratigraphy, the temporal resolution of which probably reaches 0.1 Ma in the upper Darriwilian of Baltoscandia. H. Pärnaste and V. Viira review the correlation problems related to the base of the Floian Stage, Lower Ordovician, which might be problematic without detailed conodont biostratigraphy. V. Nestor summarizes her earlier studies about the Silurian chitinozoan biozonation with a new generalization.

The contributions by L. Hints about new Hirnantian brachiopods and M. V. H. Wilson and T. Märss redescribing a famous thelodont are good examples of classical systematic palaeontology forming an essential basis for analysis of animal evolution, palaeobiodiversity and -biogeography. Papers by D. Kaljo et al. and T. Kiipli et al. demonstrate possibilities of carbon isotope chemostratigraphy and bentonite geochemistry integrated with biostratigraphy in environmental interpretation of geological processes and phenomena.

I. Grudzinska et al. discuss the history of the Baltic Sea basin over the last 4000 years, using diatom composition, lithostratigraphical evidence and AMS radiocarbon datings. T. Alliksaar and A. Heinsalu reconstruct past changes in the lake-water pH and total phosphorus through the last centuries from a small lake in southern Estonia, using quantitative models on sedimentary diatoms. The study highlights the importance of the applied role of sediment studies for lake management activities. A. Marandi et al. tune a simple model to understand the hydrogeological regime of the Voronka groundwater body in NE Estonia and discuss the groundwater management problems for the region.

Most of the papers are contributions to international co-operation programmes. Publication of this special issue was financially supported by the Institute of Geology at Tallinn University of Technology. The editors thank all contributors and the reviewers.

Atko Heinsalu, Olle Hints, Dimitri Kaljo
Editors