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Media dossier: Portrait

Dr. Andreas Gautschi, geologist

Going to great depths was always part of my plan

In order to find a safe, long-term solution to the waste management issue, information has to be collected on the underground environment and integrated into a coherent overall picture. The aim is to reduce uncertainties. “The most robust method is when different independent lines of argumentation lead to the same result”, says Dr. Andreas Gautschi, who has spent the majority of his career as a geologist with Nagra.

“I never collected minerals, or even fossils. But as a child I was fascinated by the depths of the earth.” At the close of his career as a geologist with Nagra (National Cooperative for the Disposal of Radioactive Waste), Andreas Gautschi can look back with satisfaction: “We performed pioneering scientific work with a view towards solving a task that is of immense importance for both our present society and our descendants.”

Besides the unknown depths, long time periods also hold a fascination for Andreas Gautschi. After leaving high school, he therefore decided to study geology – to the great disappointment of his chemistry teacher, he adds with a smile. However, with his interest in deep groundwaters and their composition, he found a way to combine chemistry and geology. “The isotopic signatures of groundwaters provide information on the climatic conditions under which they were formed and therefore on their age”, explains Gautschi. Geochemistry was a newly emerging research field in 1980s, but it is very relevant for the safety of a deep geological repository. “When I was a student, there were no lectures in groundwater chemistry”, adds Gautschi. The associated analytical methods were also in their infancy. “In those days there was an expert for every individual isotope somewhere in the world, but only very few could see the ‘bigger picture’.”

Andreas Gautschi obtained his doctorate from the ETH Zürich on metamorphoses and geochemistry of the mafic rocks of the eastern margin of the Bergell Granite in Canton Graubünden and Northern Italy. Instead of a dedication, his thesis contains a biblical quotation from Job 28, 1-28 on wisdom. “Surely there is a mine for silver and a place where gold is refined. Iron is taken from the earth, and copper is smelted...” smiles Gautschi: “This is a highly geological quotation.” His interest in questions of faith and religion also dates back as far as his wish to study the geological depths. Both these interests are guided by the question of the unknown and the creation of the Earth. Andreas Gautschi is a member of the Synod of the Reformed Church in Canton Aargau.

At the age of 30, Gautschi was the drillsite geologist responsible for Nagra’s first deep borehole in 1982. At that time, he was employed by a geological consulting company that was contracted by Nagra to perform the work. The geologist is still fascinated today when he thinks back to this time: “The borehole at Böttstein reached a depth of 1500 metres, 300 metres in sedimentary formations and 1200 metres in crystalline rock.” Up till then there had only been deep boreholes in sedimentary rocks in Northern Switzerland with destructive drilling. Gautschi: “Nagra needed drillcores. Questions that are important for the long-term

safety of a repository cannot be answered with rock that has been destroyed.” The deep borehole at Böttstein was technically and scientifically uncharted territory and provided him with the unique opportunity to combine practice and research. In the eighties, an extensive drilling programme with a whole series of deep boreholes lay before Nagra. Thanks to these investigations, Nagra no longer required to rely on predictions or even speculation, but had “reliable facts from the deep geological environment”, says Gautschi.

Pioneering work combined with international networking allowed Andreas Gautschi to become familiar with many national waste management programmes during the course of his career and he continuously expanded his expert knowledge. He has acted in an expert advisory capacity for programmes in France, Belgium, Finland and the United Kingdom and has been active in the Canadian programme since 2005. “International exchange is of key importance for safe waste management”, says Gautschi.

All this practical experience makes Andreas Gautschi valued as a teacher. He was a visiting lecturer at the University of Tübingen and has been lecturing since 2007 at the ETH Zürich on deep geological disposal of radioactive waste. Gautschi: “Waste disposal is applied science. The students can see how theoretical knowledge can be translated into practice.” At the same time, they learn that nuclear waste management is a task of national importance that our society cannot avoid.

Andreas Gautschi’s dedication and enthusiasm for his work are clear to see. But his life could have been completely different – more glamorous even. There could have been articles about him in the tabloid press rather than articles by him in scientific journals. The chances were good that Gautschi could have become a rock musician. In 1976, he appeared as lead guitarist with his band at the National Pop Festival in Lenzburg as the support group for Polo Hofer’s Rumpelstilz and Krokus. “For me, music was always another level of expression, the emotional side that is less analytical”, says Gautschi. Today, music means mainly recreation and relaxation. Although he appreciates all types of music, classical music takes first place. Gautschi is the Executive Producer of the British concert organist Christopher Herrick, who has recorded the complete organ works of Johann Sebastian Bach in Switzerland. He still organises concerts with Herrick in Switzerland, in the churches in Zofingen or Aarau or the cathedrals in Lucerne, Bern or Lausanne.

Andreas Gautschi retired in September. To round off his successful career, he spent a long weekend with his family (wife, four children and six grandchildren) in the Bernese Alps. “I wanted to take my family on a tour of the Grimsel Test Site to show them what I have been working on during all these years.” He can look back on his career with a sense of pride: “We have been able to bring the overall scientific picture of radioactive waste disposal into focus and have reduced the uncertainties.” His prediction for radioactive waste disposal: “We are well on the way.”

According to Swiss nuclear energy legislation, the producers of radioactive waste are responsible for its safe management and disposal. In 1972, the nuclear power plant operators and the Federal Government set up the National Cooperative for the Disposal of Radioactive Waste (Nagra) to perform this task. Nagra, with headquarters in Wetztingen (AG), is the national technical competence centre in the field of deep geological disposal of radioactive waste.

Out of a strong sense of responsibility for the long-term protection of man and the environment, 120 employees are involved daily in performing this important work. The high level of competence is secured by targeted research programmes in two Swiss underground rock laboratories and intensive international collaboration.