

Frozen Tears, a Textbook, and a Prize-Winning Photo

Anders Fridfeldt of the Department of Physical Geography and Quaternary Geology (INK) regularly takes groups of students from specialised and advanced courses on trips to the Franz Josef glacier in New Zealand. He uses reality as a textbook, and aims to develop the creativity and joy in discovery of the students, in order to create secure self-confidence in their professional roles. Anders Fridfeldt won first prize in the 2006 photography competition arranged by the Swedish Association of Scientists with a photograph taken within one of the abandoned drainage tunnels of the glacier.

The imposing Franz Josef glacier makes its way from a height of 2,700 metres above sea level down the slopes of the mountain massif of New Zealand's southern alps. At the lower limit of its 11 km extent the glacier meets fertile rain forest! An old Maori legend states that the beautiful maiden Hinehukatere persuaded her lover Tawe to climb together with her from here up into the seductive mountains. But Tawe slipped and fell to his death. The floods of tears that Hinehukatere wept in her sorrow froze to form the magnificent glacier.

Reality as a Textbook

The ice is today one of the most dynamic glaciers in the world, moving nearly two metres a day, relative to the supporting rock. Precipitation is approximately 10,000 mm per year, and this means that the mass balance (the accumulation minus the melt) changes very rapidly in association with climate variation. People from all over the world, including students from SU, visit the glacier in order to experience and study this special location. Anders Fridfeldt, for example, of the Department of Physical Geography and Quaternary Geology (INK)



Anders Fridfeldt in the field

regularly takes groups of students from specialised and advanced courses on trips here. "Of course, it's not just geographers who carry out parts of their courses in the field: biologists and geologists also use the world around us as a 'textbook' as a central part of their education. I see it as a very important part of the education, not only in order to learn certain factual knowledge in the field, but also as a means of training the abilities to discern, discover, categorise and interpret field data of various forms and from various locations", says Anders Fridfeldt. "I usually describe this as a unique skill that is often forgotten: the ability to work in unfamiliar, often difficult surroundings, and to have the ability to solve problems related to these surroundings, often under pressure of time."

A Paleoclimatic Archive

Anders Fridfeldt took the photograph that won first prize in the 2006 photography competition arranged by the Swedish Association of Scientists in one of the abandoned glacier wells. The aim of the competition is to illustrate scientific research or teaching. "The students are standing in the abandoned glacier well studying ice layers. The layers reflect the annual accumulation of snow that is converted to ice – important natural archives in the interpretation of climate variation in the region that go back a long time. What the students are actually doing there in the ice cave is 'reading paleoclimatology'," says Anders Fridfeldt, who sees the photograph as a metaphor for field-based scientific education.



The winning photograph from the Franz Josef glacier.

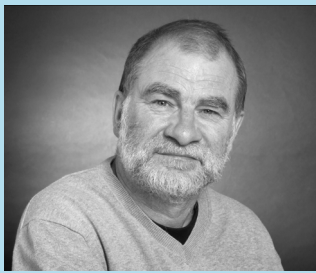
Geographers and Bridge-Building

Anders Fridfeldt emphasises how important it is to develop the independence and the problem-solving skills of the students such that they achieve a secure self-confidence in their professional role. "I'm convinced that this form of generic ability to obtain knowledge and develop skills will be in increased demand on the labour market. The difference between geographers and other scientists is that the former have an understanding of the interface between nature and social issues. Geographers have one foot in each of two scientific traditions, and they can build bridges between scientific and societal topics and methods."

Anders Fridfeldt believes that those responsible for education should pay more attention to the ability to "construct" complete structures. "During the design of an undergraduate programme in geography, we don't start by planning individual courses or course components. We maintain an alignment with the framework of the programme, of course, but we have chosen to create three thematic working groups, which work in sequence as a relay team, with the aim of designing an education that unites the three learning outcomes: a good knowledge of the subject, an ability to solve problems, and a broad mastery of methods. The Bologne process is a unique, but demanding, opportunity to examine our educational activities with respect to aims, goals, content, and educational structure", concludes Anders Fridfeldt.

Text: Marlene Lingard

The Dean's Discourse



A New Academic Year, New Opportunities

Maybe we greet every new year with particular expectations and hopes. But even so, I am bold enough to declare that 2007 offers several unusually exciting challenges, not only for the Faculty of Natural Sciences, but also for Stockholm University.

One of the greatest tasks, of course, will be the launch of all new courses and programmes according to the "Bologne process". I am confident that this will take place successfully within the faculty: we are well positioned due to the fantastic work that was carried out in the faculty last year. Two important tasks remain within the Bologne process: the introduction of a 7-point grading scale, and the adaptation of research education to the new rules. The communication of problems and ideas within the faculty will also be a significant process.

Our second major challenge is the active participation in the establishment of teacher training within SU. I believe that this will involve significant work for several of the departments within the faculty. This establishment is necessary in order to build up teacher training of a high quality, not least within the fields that are part of our faculty.

Finally, I am looking forward to starting work converting the new strategic plan into reality. The plan contains a number of tasks that are to be carried out within the period. We will be starting with an examination of the system of distributing funds within the faculty.

There is much to suggest that my second year as dean will be at least as stimulating as my first year.

Stefan Nordlund, Dean.

A Study of the Male Sand Goby and its Care of the Young

Maria Lissåker defended her doctoral thesis at the Department of Zoology on 19 January. Her thesis describes studies of how the sand goby, a small bottom-living fish, cares for its young.

Maria Lissåker describes how the male sand goby cares for the eggs until they hatch, although it may happen that the males eat some or all of the eggs. This behaviour apparently improves the ability of the male to care for several batches of eggs, since it provides him with more energy. "It is also possible that the behaviour counteracts the spread of disease", says Maria. "Cases in which the male eats a complete batch depend on the fact that the cost of caring for a small batch exceeds the benefit, which is not the case for a large batch".



Maria Lissåker (photo J. Lissåker)

The female sand goby lays her eggs covered in sand in a mussel shell, where they

are well camouflaged. But the eggs must be ventilated if they are to develop, and so the males increase the size of the entrance to the nest when the oxygen level is low, in order to facilitate ventilation. Unfortunately for the sand goby progeny, however, it then becomes easier for predators to discover the nest and occupy it in their search for eggs. The sand goby progeny are under threat from several sources. Maria has not discovered any counter-strategy that the females have against the egg-eating males, apart from their choice of laying eggs where other females have already laid eggs. It would otherwise be natural to believe that the females put a lot of effort into choosing more caring fathers, but this is not the case.

Maria is now hoping to continue her research into the behaviour of the sand goby.

Mathematical Challenges

The Department of Mathematics has arranged a mathematics competition for teachers in mathematics and science for the fifth consecutive year, in collaboration with the education company Theducation. The competition was won in 2006 by Björn Winnerfjord and Cecilia Börjesson from the NTI upper secondary school in Göteborg. More information is available at www.math.su.se/kappa2006/.

The Department of Mathematics arranges a competition for upper secondary pupils each year. The best submitted mathematical text, which may be part of a project, for example, wins a prize of SEK 5,000. The final date for submitting entries this year is 30 April. All necessary information can be found at www.math.su.se.

More Maths: Info for Teachers

The Dept. of Mathematics is pleased to invite upper secondary teachers, student guidance officers, etc., to an information evening about the new study programmes in mathematics. The evening will be held on 19 February, and more information can be found at www.math.su.se.

Saeid Changes the World

Saeid Esmailzadeh, associate professor at the Department of Physical, Inorganic and Structural Chemistry, has been recognised by the magazine *Bon International* as a Swede who "changes the world". The magazine has listed 50 Swedes (most of them young people) who have achieved prominence in their fields, and who, it is predicted, will remain prominent. The list includes the rock group The Hives, Crown Princess Victoria and Sophie Stenbeck. Saeid Esmailzadeh achieves his place on the list as a result of his discovery of a new superglass, and the company he has founded to commercialise the discovery.

New Co-worker at the Faculty Office

The faculty office at the Faculty of Science welcomes a new co-worker. Felicia Markus will be acting as temporary replacement for Anna Riddarström (who is taking maternity leave) until 30 June 2007. Felicia can be reached at telephone: 08-161767, felicia-markus@natkan.su.se.