Geophysical Research Abstracts,
Vol. 10, EGU2008-A-12415, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-12415
EGU General Assembly 2008

The fascination of air bubbles in ice

D. Raynaud

Laboratoire de Glaciologie et Géophysique de l'Environnement, CNRS Université Joseph Fourier, Saint-Martin-d'Hères, France (raynaud@ujf-grenoble.fr)

It is the second time that the Hans Oeschger Medal is awarded for a contribution to ice core research and more specifically to atmospheric reconstructions based on measurements on the air entrapped in ice. Why are the frozen air bubbles the object of such fascination leading to a significant recognition in the scientific community?
Pioneering works at the beginning of the 80's, showing low CO_2 values during the Last Glacial Maximum from different ice cores, produced the first evidence confirming the prediction of S. Arrhénius made 84 years before that the atmospheric CO_2 concentration was lower during the ice age than during the Holocene.
During the 80's and 90's, the greenhouse gas record was progressively extended from one to four climatic cycle. It covers today the last 800,000 years and has become *the reference* highlighting the unprecedented nature of the anthropogenic greenhouse gas "explosion" during the late Quaternary. The record demonstrates the remarkable glacial-interglacial correlation between CO_2 and CH_4 and climate. It is used as input data when modelling the past climate. The CO_2 changes appears to have widely contributed to the glacial-interglacial temperature changes, but still the control - response sequence between CO_2, northern and southern temperatures has to be better understood, as well as the relative role of the different components of the carbon cycle triggering the observed atmospheric changes.
We also start to have enough resolution to investigate the greenhouse gas variability at the millennial scale, both under glacial and interglacial conditions.
The air entrapped in polar ice contains several other tools like a "paleothermometer" and a "paleoaltimeter" documenting other climate-related information, including past changes in surface elevation and in local insolation as well as abrupt warming/cooling at the surface or the hydrological cycle.

I will address a large range of this ice core cornucopia, which results from the work of many scientists and technicians around the world fascinated by those myriads of air bubbles. The lecture is dedicated to them.