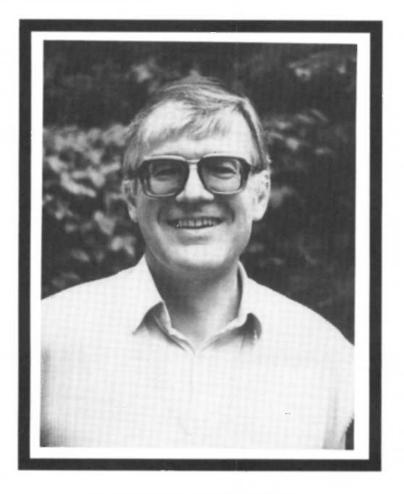
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ULRICH SIEGENTHALER, 1941–1994

On 15 July 1994, Ulrich Siegenthaler, Professor at the Physics Institute in Bern, Switzerland, died at the age of 53. We lost an excellent scientist and a good friend and colleague.

His research may be characterized by the two words, *interdisciplinarity* and *quality*. He was an expert in various fields. He was, for example, interested in the global carbon cycle and the greenhouse effect, in climate change and the role of the ocean and the biosphere, in the global water cycle and in isotope hydrology. In some of these fields, he was active in an experimental way, and in other fields, in a theoretical way, as a modeler.

The high quality of Uli Siegenthaler's research is visible in:

- his many publications in reputed journals. One example is the famous article on the box diffusion model that he wrote with Hans Oeschger in 1975;
- his engaged activity in various national and international committees. He participated in JGOFS, SCOPE, IGBP, IPCC and others;
- his shared knowledge as an advisor for journals such as *Tellus* and *Climate Dynamics*. For many years, he was an Associate Editor of *RADIOCARBON*;
- his election as a Fellow of the American Geophysical Union for the year 1994.

vi Obituary

One consequence of his broad and active research interests were the many friends gathered all over the world. I think that the friendships are even more important than the number of papers that he had published. Uli was welcome in many universities and institutes in Switzerland and abroad. Twenty years ago, he was the guest, for one year, of Joel Gat at the Weizmann Institute in Rehovot, where he worked on isotopic fractionation during the evaporation of precipitation. He later visited Karl Otto Münnich in Heidelberg for several months, and Jorge Sarmiento, at Princeton. Uli collaborated with other physicists, as well as biologists, botanists, chemists, oceanographers and geologists. And he was not only appreciated by scientists from far and wide; everybody within his group and in the Institute liked him as a partner in discussions. Students also liked his quiet, kind and friendly manner.

We, who all lost a good friend, will remember mainly these characteristics of friendly discussions. Although his scientific scale was at a high level, and he could be critical, his advice was always constructive and helpful. Therefore, we will remember Uli Siegenthaler as a brilliant scholar, and at the same time, as a very dear colleague. Let's hope that we, ourselves, may continue in his style, and always take the time, besides our work, for friendship among colleagues in a peaceful atmosphere.

Heinz Hugo Loosli

SELECTED BIBLIOGRAPHY

Carbon Cycle, Atmospheric CO₂ Increase and Greenhouse Effect

- Siegenthaler, U. 1983 Uptake of excess CO_2 calculated by an outcrop diffusion model of the ocean. *Journal of Geophysical Research* 88: 3599–3608.
- _____1984 19th century measurements of atmospheric CO₂ a comment. *Climatic Change* 6: 409–411.

_____1986 Carbon dioxide: Its natural cycle and anthropogenic perturbation. In Buat-Ménard, P., ed., The Role of Air-Sea Exchange in Geochemical Cycling. Dordrecht, Reidel: 209-247.

_____1990 El Niño and atmospheric CO₂. *Nature* 345: 295–296.

1993 Modelling the present-day oceanic carbon cycle. *In* Heimann, M., ed., *The Global Carbon Cycle*. Berlin, Springer-Verlag: 368–395.

- Siegenthaler, U., Friedli, H., Loetscher, H., Moor, E., Neftel, A., Oeschger, H. and Stauffer, B. 1988 Stable isotope ratios and concentration of CO₂ in air from polar ice cores. *Annals of Glaciology* 10: 151–156.
- Siegenthaler, U., Heimann, M. and Oeschger, H. 1980
 ¹⁴C variations caused by changes in the global carbon cycle. *In* Stuiver, M. and R. S., eds., Proceedings of the 10th International ¹⁴C Conference. *Radiocarbon* 22 (2): 177–191.
- Siegenthaler, U. and Joos, F. 1992 Use of a simple model for studying oceanic tracer distributions and the global carbon cycle. *Tellus* 44B: 186–207.
- Siegenthaler, U. and Münnich, K. O. 1980 ¹³C/¹²C fractionation during CO₂ transfer from air to sea. *In* Bolin, B., ed., *Carbon Cycle Modelling*. SCOPE Report 16. Chichester, John Wiley & Sons: 249–257.

- Siegenthaler, U. and Oeschger, H. 1978 Predicting future atmospheric carbon dioxide levels. *Science* 199: 388– 395.
- 1984 Transient temperature changes due to increasing CO₂ using simple models. *Annals of Glaciology* 5: 153–159.
- <u>1987</u> Biospheric CO_2 emissions during the past 200 years reconstructed by deconvolution of ice core data. *Tellus* 39B: 140–154.
- Siegenthaler, U. and Sanhueza, E. 1991 Greenhouse gases and other climate forcing agents. In Jäger, J. and Ferguson, H. L., eds., Climate Change: Science, Impacts and Policy. Proceedings of the 2nd Second World Climate Conference. Cambridge, Cambridge University Press.
- Siegenthaler, U. and Sarmiento, J. 1993 Atmospheric carbon dioxide and the ocean. *Nature* 365: 119–125.
- Siegenthaler, U. and Wenk, Th. 1984 Rapid atmospheric CO_2 variations and ocean circulation. *Nature* 308: 624-626.
- Beer, J., Bonani, G., Hofmann, H. J., Suter, M., Synal, A., Wölfli, W., Oeschger, H., Siegenthaler, U. and Finkel, R. C. 1987 ¹⁰Be measurements on polar ice: Comparison of Arctic and Antarctic records. *Nuclear Instruments and Methods in Physics Research* B29: 203– 206.
- Beer, J., Joos, F., Lukasczyk, Ch., Mende, W., Rodriguez, J., Siegenthaler, U. and Stellmacher, R. 1994 ¹⁰Be as an indicator of solar variability and climate. *In Nesme-*Ribes, E., ed., *The Solar Engine and its Influence on Terrestrial Atmosphere and Climate.* NATO ASI Series 25: 221–233.

- Beer, J., Siegenthaler, U., Bonani, G., Finkel, R. C., Oeschger, H., Suter, M. and Wölfli, W. 1988 Information on past solar activity and geomagnetism from ¹⁰Be in the Camp Century ice core: . *Nature* 331: 675–679.
- Beer, J., Andrée, M., Oeschger, H., Siegenthaler, U., Bonani, G., Hofman, H. J., Morenzoni, E., Nessi, M., Suter, M., Wölfli, W., Finkel, R. and Langway, C. C. 1984 The Camp Century ¹⁰Be record: implications for long-term variations of the geomagnetic dipole moment. *Nuclear Instruments and Methods in Physics Research* B5: 380–384.
- Bolin, B., Keeling, C. D., Bacastow, R. B., Björkstrom, A. and Siegenthaler, U. 1980 Carbon cycle modelling. *In* Bolin, B., ed., *Carbon Cycle Modelling*. SCOPE Report 16. Chichester, John Wiley & Sons: 1–28.
- Friedli, H., Lütscher, H. P., Oeschger, H., Siegenthaler, U. and Stauffer, B. 1986 Ice core record of the ¹³C/¹²C ratio of atmospheric CO₂ in the past two centuries. *Nature* 324: 237–238.
- Friedli, H., Moor, E., Oeschger, H., Siegenthaler, U. and Stauffer, B. 1984 ¹³C/¹²C ratios in CO₂ extracted from Antarctic ice. *Geophysical Research Letters* 11: 1145– 1148.
- Friedli, H. and Siegenthaler, U. 1987 Influence of N₂O on isotope analyses in CO₂ and mass-spectrometric determination of N₂O in air samples. *Tellus* 40B: 129– 133.
- Friedli, H., Siegenthaler, U., Rauber, D. and Oeschger, H. 1987 Measurements of concentration, ¹³C/¹²C and ¹⁸O/¹⁶O ratios of tropospheric carbon dioxide over Switzerland. *Tellus* 39B: 80–88.
- Hesterberg, R. and Siegenthaler, U. 1991 Production and stable isotopic composition of CO₂ in a soil near Bern, Switzerland. *Tellus* 43B: 197–205.
- Jähne, B., Münnich, K. O. and Siegenthaler, U. 1979 Measurements of gas exchange and momentum transfer in a circular wind tunnel. *Tellus* 31: 321–329.
- Joos, F., Sarmiento, J. L. and Siegenthaler, U. 1991 Estimates of the effect of Southern Ocean iron fertilization on atmospheric CO₂ concentration. *Nature* 349: 772– 774.
- Joos, F., Siegenthaler, U. and Sarmiento, J. L. 1991 Possible effects of iron fertilization in the Southern Ocean on atmospheric CO₂ concentration. *Global Biogeochemical Cycles* 5:135–150.
- Leuenberger, M., and Siegenthaler, U. 1992 Ice-age atmospheric concentration of nitrous oxide from an Antarctic ice core. *Nature* 360: 449-451.
- Leuenberger, M., Siegenthaler, U. and Langway, C. C. 1992 Carbon isotope composition of atmospheric CO₂ during the last ice age from an Antarctic ice core. *Nature* 357: 488–490.
- Oeschger, H., Joos, F. and Siegenthaler, U. 1992 Urgency of CO₂ emission control. EOS 73: 321–324.
- Oeschger, H. and Siegenthaler, U. 1979 Prognosis for the expected CO₂ increase due to fossil fuel combustion. In Berger, R. and Suess, H. E., eds., Radiocarbon Dating, Proceedings of the 9th International ¹⁴C Confer-

ence. Berkeley/Los Angeles: University of California Press: 633-642.

- Oeschger, H., Siegenthaler, U., Schotterer, U. and Gugelmann, A. 1975 A box diffusion model to study the carbon dioxide exchange in nature. *Tellus* 27: 168–192.
- Sarmiento, J. L., Orr, J. C. and Siegenthaler, U. 1992 A perturbation simulation of CO₂ uptake in an ocean general circulation model. *Journal of Geophysical Re*search 97: 3621–3645.
- Saurer, M., Fuhrer, J. and Siegenthaler, U. 1991 Influence of ozone on the stable carbon isotope composition, δ¹³C, of leaves and grain of spring wheat (Triticum aestivum L.). *Plant Physiology* 97: 313–316.
- Stauffer, B., Hofer, H., Oeschger, H., Schwander, J. and Siegenthaler, U. 1984 Atmospheric CO₂ concentration during the last glaciation. Annals of Glaciology 5: 160–164.
- Watson, R. T., Rodhe, H., Oeschger, H. and Siegenthaler, U. 1990 Greenhouse gases and aerosols. In Houghton, J. T., Jenkins, G. J. and Ephraums, J. J., eds., Climate Change: The IPCC Scientific Assessment. Cambridge, Cambridge University Press: 1-40.
- Wenk, Th. and Siegenthaler, U. 1985 The high-latitude ocean as a control of atmospheric CO₂. In Sundquist, E. T. and Broecker, W. S., The Carbon Cycle and Atmospheric CO₂: Natural Variation. Geophysical Monograph 32. Washington, D.C., American Geophysical Union: 185–194.

Climate History

- Siegenthaler, U., Eicher, U., Oeschger, H. and Dansgaard, W. 1984 Lake sediments as continental ¹⁸O records from the transition glacial-postglacial. *Annals* of Glaciology 5: 149–152.
- Andrée, M., Oeschger, H., Siegenthaler, U., Riesen, T., Moell, M., Ammann, B. and Tobolski, K. 1986 ¹⁴C dating by AMS of plant macrofossils in lake sediments. *In* Stuiver, M. and Kra, R., eds., Proceedings of the 12th International ¹⁴C Conference. *Radiocarbon* 28(2A): 411–416.
- Eicher, U. and Siegenthaler, U. 1976 Palynological and oxygen isotope investigations on late-glacial sediment cores from Swiss lakes. *Boreas* 5: 109–117.
- Eicher, U., Siegenthaler, U. and Wegmüller, S. 1981 Pollen and oxygen isotope analyses on late- and postglacial sediments of the Tourbière de Chirens (Dauphiné, France). *Quaternary Research* 15: 160–170.
- Lotter, A. F., Eicher, U., Birks, H. J. F and Siegenthaler, U. 1992 Late-glacial climatic oscillations as recorded in Swiss lake sediments. *Journal of Quaternary Science* 7: 187–204.
- Oeschger, H., Beer, J., Siegenthaler, U., Stauffer, B., Dansgaard, W. and Langway, C. C. 1984 Late-Glacial climate history from ice cores. In Hansen, J. E. and Takahashi, T., eds., Climate Processes and Climate Sensitivity. Geophysical Monograph 29. Washington, D.C., American Geophysical Union: 299–306.

Oeschger, H., Welten, M., Eicher, U., Möll, M., Riesen, T., Siegenthaler, U. and Wegmüller, S. 1980 ¹⁴C and other parameters during the Younger Dryas cold phase. *In* Stuiver, M. and Kra, R. S., eds., Proceedings of the 10th International ¹⁴C Conference. *Radiocarbon* 22(2): 299–310.

Isotopes in the Water Cycle

- Siegenthaler, U. and Oeschger, H. 1980 Correlation of ¹⁸O in precipitation with temperature and altitude. *Nature* 285: 314–317.
- Siegenthaler, U., Oeschger, H., Schotterer, U. and Hänni, K. 1975 Conversion of water to a counting gas for low-level tritium measurements by means of aluminium carbide. *International Journal Of Applied Radiation and Isotopes* 26: 459–464.
- Amberger, G., Siegenthaler, U. and Verstraete, P. 1981 Etudes en cours de la nappe souterraine de l'Arve. Eclogae Geologicae Helvetiae 74: 225-232.
- Baltensperger, U., Schwikowski, H., Gäggeler, H. W., Jost, D. T., Beer, J., Siegenthaler, U., Wagenbach, D., Hofmann, H. J. and Synal, H. A. 1993 Transfer of at-

mospheric constituents into an Alpine snow field. Atmospheric Environment 27: 1881-1890.

- Lehmann, M. and Siegenthaler, U. 1991 Equilibrium isotope fractionation between ice and water. *Journal of Glaciology* 37: 23-26.
- Müller, I., Schotterer, U. and Siegenthaler, U. 1982 Etude des charactéristiques structurales et hydrodynamiques des aquifères karstiques par leur réponses naturelles et provoquées. Eclogae Geologicae Helvetiae 75: 65– 75.
- Schotterer, U., Finkel, R., Oeschger, H., Siegenthaler, U., Bart, G., Gäggeler, H. and von Gunten, H. R. 1977 Isotope measurements on firn and ice cores from Alpine glaciers. In *Isotopes and Impurities in Snow and Ice*. Proceedings of the Grenoble Symposium, August/ September 1975. IAHS Publication 118. International Association of Hydrological Sciences: 232–236.
- Wright, R. F., Matter, A., Schweingruber, M. and Siegenthaler, U. 1981 Sedimentation in Lake Biel, an eutrophic, hard-water lake in north-western Switzerland. Schweizerische Zeitschrift für Hydrologie 2: 101–126.