

## OBITUARY: WILLEM GERRIT MOOK (1932–2016)



Wim Mook was born in Groningen, the Netherlands, in 1932, and studied physics and chemistry at the University of Groningen. He started his PhD work in 1962, under the supervision of John Vogel (1932–2012), who was then the leader of the Groningen  $^{14}\text{C}$  laboratory. At the time, stable isotopes were introduced in the world of  $^{14}\text{C}$  dating. Vogel acquired the first mass spectrometer for Groningen, the Atlas MAT 86. Wim worked with this machine, and set up systems for  $^{13}\text{C}$  and  $^{18}\text{O}$  analysis for water and carbonates. His thesis title was “Geochemistry of the Stable Carbon and Oxygen Isotopes of Natural Waters in the Netherlands.” He defended his thesis in 1968. By then, John Vogel had left Groningen for Pretoria in his home country, South Africa. Wim stayed on running the Groningen laboratory, becoming lecturer in 1975 and then professor in 1980.

Wim transformed the research unit from “ $^{14}\text{C}$  laboratory” to “Center for Isotope Research” (CIO), a facility for precise measurements of all the natural isotopes of the elements H, C, N, and O; thus, in addition to the ones already mentioned, also deuterium and tritium were measured. Apart from operating as a measuring facility for outside users, Wim and his group actively participated in research on wide-ranging applications: archaeology, paleobotany, paleoecology, hydrology, geosciences, oceanography, atmospheric science, soil science, food authenticity, and biomedical sciences.

During the 1980s, alpha-spectrometry was installed with the goal of extending the dating range beyond the  $^{14}\text{C}$  timescale. U/Th disequilibrium dating was applied in a variety of projects. The setup was also used for incidental research, like radioactive pollution measurements connected to the Chernobyl disaster.

At the end of the 1970s, Wim entered the field of greenhouse gas research: in a long-lasting collaborative project with the late Charles Keeling, he started systematic stable isotope measurements on atmospheric  $\text{CO}_2$ , from Mauna Loa, the South Pole, and several other stations of “the Keeling network.” Given the required accuracy, these measurements were very demanding. After measurement, a selection of samples was stored, and many years later, they have been used for  $^{14}\text{C}$  measurements, using AMS.

Research concerning technical improvements were not forgotten. Among these was a large volume (6.8 L) proportional counter that was constructed for high precision (1–2‰)  $^{14}\text{C}$  dating. It served us particularly well for calibration work of dendrochronologically dated wood and intercomparisons for an established working group of six high-precision conventional laboratories: Arizona, Belfast, Groningen, Heidelberg, Pretoria, and Seattle.

Also, a  $^{14}\text{C}$  enrichment method based on thermodiffusion of CO was developed and applied to dating successfully. Both methods required quite large amounts of sample material.

At the other end of the “sample amount” spectrum, Wim was successful in the acquisition of an AMS, which was formally ordered in 1990. The Woods Hole facility was just running, and we obtained this newly designed system, characterized by a recombinator for simultaneous injection. But the system was then built by High Voltage Engineering Europa, for us conveniently located in Amersfoort, 2 hours from Groningen.

Wim was especially fond of complex geochemical fractionation processes in aquatic environments. There are many publications and book contributions that are still being used. Wim was also extraordinary professor of isotope hydrology at the VU (Free University) in Amsterdam for many years.

He was also elected as a member of the Royal Dutch Academy of Sciences (KNAW), section earth sciences.

For the journal *Radiocarbon*, Wim served as an associate editor.

Together with the Groningen archaeologist Tjalling Waterbolk he started the successful conference series “ $^{14}\text{C}$  and Archaeology.” The first two were held in Groningen, in 1981 (proceedings published in PACT publication series no. 8) and in 1987 (PACT publication series no. 29). The 8th in this series will be held this year in Edinburgh.

For many  $^{14}\text{C}$  conferences, he will be remembered for serving as chairman of business meetings, skilfully directing a can of worms—and for his professionally playing the grand piano.

Towards the end of his career (1990–1997), Wim became scientific director of the Dutch Sea Research Institute (NIOZ), but he kept his, now part-time, professorship in Groningen. A remarkable event (especially for us at CIO) was his “retirement party” during the 16th International Radiocarbon Conference in Groningen. The proceedings of this conference were dedicated to Wim by the editor, Austin Long. From this dedication, we use the following quote which says it all: “the Radiocarbon community contains many high-achiever specialists, but few high-achiever generalists, such as you.”

Wim passed away on January 24, 2016, at his home in Haren near Groningen. He is survived by his wife Betty, 3 children and 4 grandchildren.

We will remember him gratefully, as a powerful yet pleasant leader and friend who has made a great contribution to radiocarbon and stable isotope research and applications, and through that to our group and the University of Groningen as a whole.

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