

## University of Groningen

### Obituary

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## OBITUARY: JOHANN CARL VOGEL (1932–2012)



John Vogel passed away in January 2012 and the radiocarbon community lost one of its pioneers and active contributors.

Johann Carl Vogel was born in Pretoria, South Africa, and studied at the University of Pretoria, obtaining a BSc and then an MSc in chemistry in 1955. He then moved to the University of Heidelberg, Germany, where he obtained his doctorate in 1959 with a thesis on the determination of carbon isotope fractionation factors. In 1961, John moved to Groningen. For this era, see the contribution below of Wim Mook and Hans van der Plicht.

In 1967, John returned to his home country and established a brand-new laboratory at the CSIR in Pretoria. He had a 25-m-deep counting room built to house  $^{14}\text{C}$  and  $^3\text{H}$  counters and acquired 2 mass spectrometers for  $^{13}\text{C}$ ,  $^{18}\text{O}$ , and D analysis. I (ST) joined him in 1968 with the goal to use stable isotope techniques. I encountered a man with a wide, in-depth knowledge of science and the world who had the ability to work himself into a new field, make a contribution and, very often, move out again when the “specialists” took over.

John’s principal interest throughout his career remained archaeology. In Pretoria, he started by using  $^{14}\text{C}$  to construct a timeframe for the many archaeological sites that had already been excavated in the southern African region and kept it up over the years. He worked closely with the archaeologists, knew their sites well, and contributed actively with the interpretation of the results. He meticulously maintained his three  $^{14}\text{C}$  counters in Pretoria for 30 years and produced nearly 8000 quality  $^{14}\text{C}$  results. Virtually every  $^{14}\text{C}$  date in southern Africa from this period carried a Pta- number. Already in 1972, Peter Beaumont and John published a paper in *Nature* on the dating of the Stone Age in South Africa, which laid the framework for the “Out of Africa” hypothesis: a term that John had coined several years before it came into general usage (Vogel JC, Beaumont PB. 1972. Revised radiocarbon chronology for the Stone Age in South Africa. *Nature* 237(5349):50–1).

When it became obvious that the important Middle Stone Age in southern Africa was too old for  $^{14}\text{C}$  dating, John investigated the potential of other dating techniques. He established limited facilities in Pretoria for uranium series and luminescence dating. He encouraged visits from people abroad with the relevant expertise to advise him and eventually to take over the dating of southern African sites. The Middle Stone Age at the southern tip of Africa is now well dated through analyses done by laboratories all over the world.

For his entire career, John used his high-precision counters to continue his interest in the calibration of  $^{14}\text{C}$  dates. He was part of the international effort to produce standardized  $^{14}\text{C}$  calibration curves and was involved in much of the laboratory intercomparison. As a South African, he was a man of the Southern Hemisphere, and found and explained the difference of atmospheric  $^{14}\text{C}$  between the hemispheres based on tree-ring data from South America, South Africa, and New Zealand. These calibrations became particularly necessary for accurate dating of the Iron Age in South Africa, Botswana, and Zimbabwe.

One of the goals for the establishment of the isotope laboratory in Pretoria was to develop isotope applications for local groundwater. This proved to be particularly useful in the arid parts (the Kalahari Thirstland). Starting with surveys with  $^{14}\text{C}$  and  $^{18}\text{O}$ , we later unleashed a range of isotope techniques on local aquifers and were able to demonstrate groundwater flow, arid zone recharge, denitrification, etc. Due to the efforts of the isotope laboratories in Pretoria, and nearby Johannesburg, isotope hydrology is now well established amongst local geohydrologists. We could also use paleo data from groundwater aquifers to supplement Quaternary records obtained by other means.

John made a big impact on the use of  $^{13}\text{C}$ , and later  $^{15}\text{N}$ , in foodchain studies. It all started with him growing maize in his German student room, to establish whether its  $^{13}\text{C}$  fractionation was the same in Germany as in South Africa. He then grew  $\text{C}_3$  and  $\text{C}_4$  plants under variable carbon dioxide levels and in 1980 developed a model that explained the carbon isotope fractionation during photosynthesis. He followed this up with surveys of grasses over the entire subcontinent and isotope analysis of modern and old, animal and human bone material. These studies led to publications in *Nature* in 1978, 1981, 1986 and 1990, and involved sites from all over southern Africa, as well as the Americas. Southern Africa is well suited for this purpose since both  $\text{C}_3$  and  $\text{C}_4$  grasses occur here and the wildlife consumes mixtures of grass and other plants. The variety of stable isotope signals that appear in archaeological material has been extremely useful for paleoenvironmental studies and these approaches have now become standard archaeological practice.

In the 1960s and 1970s, John's laboratory got involved with some greenhouse issues. We surveyed for  $^{14}\text{C}$  in surface water of the southern Atlantic and Indian oceans (and even a few sets of deep samples). We briefly set up an atmospheric  $\text{CO}_2$  analysis system. These efforts did not develop into anything worthwhile. To run them effectively, collaboration with international programs is essential. This was not John's style and, anyway, South African scientists were not popular abroad at that time and some doors were very tightly closed to us.

By the time that he retired in 1997, John had published 212 papers in a wide range of international and national journals, in many languages and with data from all the continents. After his retirement, he continued to write and a further 20 papers appeared, the latest in 2008. He also contributed to the activities of the University of the Third Age by presenting various courses along his own interests and retained his interest in local archaeological activities.

John's contributions to science, and particularly archaeology, have been recognized by a number of awards from South African professional organizations. He was a Fellow of the Royal Society of

South Africa and an honorary life fellow of the International Union for Quaternary Research. In 1998, he was awarded an honorary doctorate by the University of Cape Town.

John Vogel was a very private man, who sheltered himself behind an often prickly exterior. He was a born scientist and had many original ideas that he would fiercely defend. His pet hates were illogical reasoning and bureaucracy, and those who practiced it crossed his path at their peril. However, those who got to know him and subsequently worked with him, felt privileged to have had the opportunity of being exposed to his breadth of knowledge and his deep understanding of the physical processes behind the methods that he employed. Tea-times in his lab were always interesting and ranged from science, politics, art, and history. It was very seldom that he did not contribute a new angle to a discussion. He was a very special man and will be missed by those who worked closely with him.

*Siep Talma, Ebbie Visser, and Annemarie Fuls*  
Pretoria, South Africa



John Vogel during his Groningen years

John Vogel was a broad isotopist, interested and active in the application of radiocarbon, stable isotopes, tritium, and the uranium series. In Heidelberg, where he did his PhD research, he constructed a mass spectrometer for the analysis of the carbon and oxygen isotopes. He also started to study the combination of  $^{14}\text{C}$  and  $^{13}\text{C}/^{12}\text{C}$  in the inorganic carbon content of groundwater, aiming at determining the “age” of groundwater (i.e. the time lapse since infiltration) together with Karl Otto Münnich. This work was later extensively continued in Groningen by his pupil and PhD student, Wim Mook.

After the tragic and untimely death of the famous Hessel de Vries, John was selected to become the leader of the Groningen laboratory in 1961. K O Münnich is on record with the recommendation, “he is already speaking some kind of Dutch anyway.”

In Groningen, John was confronted with a vast heritage in the field of archaeology and Quaternary geology. He was never the sole physicist and chemist producing the necessary high-quality data: he

became the archaeologist and the geologist and the hydrologist, and published several joint papers on these subjects. We refer here to the Groningen datelists published by Vogel and the Groningen archaeologist Waterbolk between 1963 (datelist IV) and 1972 (datelist X) in the journal *Radiocarbon*.

Datelist IV (1963) marks the transition from GrO to GrN for the Groningen laboratory code, after applying correction for the Suess effect of all previous dates. The paper also states “ages are expressed in years before 1950. To convert these ages into dates BC, 1950 years need to be subtracted.” Calibration was still to be discovered.

Datelist X (1972) was published after John returned to South Africa, and contains most of the unpublished  $^{14}\text{C}$  dates measured between 1961 and 1968, including earlier analysis performed by De Vries, and a few results obtained since Wim Mook assumed responsibility for the laboratory in 1969.

John also took up the interesting and, what later turned out to be the highly relevant, subject of the natural variations of  $^{14}\text{C}$  concentration in tree rings, representing the natural variations in the atmospheric  $\text{CO}_2$ . De Vries was the first to publish on this phenomenon and John made the necessary corrections for carbon isotope fractionation, once the stable isotope mass spectrometer was put into operation in the Groningen laboratory. Later, in Pretoria, he kept his interest in the natural variations. A series of dendrochronologically dated German oak, obtained from Bernd Becker, was dated by  $^{14}\text{C}$  in Pretoria. This record was combined with the one measured in Groningen, resulting in a unique high-precision data set for the 4th/3rd millennium BC, which is an important contribution to the established  $^{14}\text{C}$  calibration curve IntCal.

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