In Memory of

Steve Wing

Oct. 3rd 1952 – Nov. 9th, 2016

On March 28th, 1979 the atomic power plant Three Mile Island at Harrisburg, Pennsylvania, USA went out of control after a loss of coolant. In the nuclear core a partial meltdown caused the release of large quantities of gaseous radionuclides. The people living nearby were concerned - but the authorities played it down. The radiation exposure to people in the vicinity of the reactor was alleged to be less than one X-ray of the chest, and officials therefore excluded any consequences on human health.

In the beginning of the 1990s increased rates of cancer were observed among children and young adults in the area close to the damaged reactor. The results were published, but the authors excluded any relation to the radioactive releases because the resulting radiation exposure to the area would be too low to explain any of the epidemiological findings. Steve Wing and his coauthors David Richardson, Dana Armstrong and Douglas Crawford-Brown demonstrated 1979 that the cancer frequency in the direct area of the reactor correlated very well with the spatial distribution of the released radionuclides - that could be modelled based on the local meteorological conditions at the very time of the accident. There was no evidence for any other explanation for the epidemiological findings. His paper in one of the most eminent scientific Journals stimulated a series of emotional letters to the editor that had, however, had little evidence to provide. Steve's response to these letters almost 20 years ago was titled a *collision of evidence and assumptions*. Steve's position, for one, was clear - his contribution was to the evidence.

Steve did research on the health risks of workers in the Manhattan project and other institutions of the US American Department Of Energy - the military-industrial-complex of nuclear power in the US. He improved the methods of cohort analysis with employees exposed to occupational radiation, he investigated quantitative differences in radiation action on older compared to younger people, and to the general population. Many of his articles had a methodologic focus but the core topic often was how radiation exposure afflicts the health of the people exposed. And that the dose-response relation between radiation dose and health detriment is independent from whether nuclear technology is used for energy generation or for the construction of nuclear bombs.

Steve's paper in the Journal of the American Medical Association in 1991 was a breakthrough in the epidemiology of low-dose radiation. Not only that this was one of the first articles addressing risks of low level radiation ever published in a mainstream scientific Journal - Steve also could show in a well documented cohort of workers that an increased cancer risk could directly be observed epidemiologically in a human population. Moreover, the dose-response relation in this cohort was significantly higher than expected based on the lifespan study of the survivors of the nuclear bomb attacks on the Japanese cities of Hiroshima and Nagasaki - that were used as the reference until this time.

This article brought Steve and his group in contact to the group of Inge Schmitz-Feuerhake in Bremen, Germany, and also to Alice Stewart, Birmingham, UK.

Alice Stewart later received the alternative Nobel prize for her work on low level radiation. Steve was impressed and inspired by Alice's work and I think the same was true vice versa – Alice liked him for his consequent analytic, critical methodologic approach, and his consistency, fearlessness, independence and incorruptibility – in all this, he was just as her.

Steven Bennett Wing

*** Oct. 3rd 1952 + Nov. 9th, 2016**

I met Steve Wing personally the first time when I was applying to the Master of Public Health program to the University of North Carolina at Chapel Hill (UNC) in the year 1993. I knew him from his publications on the health risks of low level radiation and he was recommended to me by Inge Schmitz-Feuerhake, who - together with Horst Kuni - had advised me in my doctorate until shortly before. When I started my MPH studies with Steve in 1995, the program in the UNC was ranked at the top position sharing the first rank with Harvard School of public health in Boston, MA. The UNC school was still called school of public health - years later she was renamed to Gillings School of Global Public Health following a major donation of a company that earned its money with clinical studies partly conducted in developing countries. Steve was appalled and alarmed, and he lobbied against this taking-in of an academic institution by corporate interests. Under the heading "*getting UNC in line*" he wrote on January 26th, 2015 in a scathingly ironical article "*... there are far too many buildings and schools in the UNC system that have not been named for wealthy individuals and companies"* and further on: *„ (…) funding UNC through wealthy donors helps protect the university from the influence of elected officials who control tax dollars.*"

Steve was a dedicated teacher, an engaged advisor, and a critical thinker – always searching for the core - the reason and purpose of public health – epidemiology was for him the *science for the exposed* - how he called it. Not to serve as a fig leaf for the wealthy who benefit economically from inappropriate protective measures, from downplaying health risks, and too high limits for

permissible occupational exposure. Not the science for those who are in power and support and protect the corporate interests against public health. But he also knew *the limits of epidemiology* (1994) exactly, was aware of the social and political core of health research "*Whose epidemiology, whose health ?*" (2004) - he lived and worked far off the marble tower that so many colleagues are trapped in. *Environmental epidemiology, public health advocacy, and policy* (1998). Steve was highly honored - the research integrity award of the international Society for Environmental Epidemiology (2009), and the self-determination award of the Black Workers for Justice (2014) stand out.

We have visited each other several times over the years, have done research together, have discussed and published. Steve was teacher, advisor, professional role model, and personal friend. He was proud when my wife and myself named our son Yannic Peter Steve, born 2000, after him - and had always a special relation to him.

In 2011 Steve participated in a summer school in Turkey for scientists and clinicians from the Basrah Medical University, Iraq, which was funded by the German Academic Exchange Organisation. He flew over, and discussed with the participants the *Philosophy of Epidemiology*. The afternoon session went on the whole evening and our colleagues listened very carefully. We could literally sense how Steve touched and inspired them in their innermost. And then the first one took a heart and spoke up - first timidly but then others joined in more openly - positions were formulated and put to discussion and soon the debate went on to what mattered to our Iraqi colleagues: the chances of science to contribute to the reconstruction of their maltreated and devastated country. That science can help overcome the international isolation, make help to develop a more peaceful and better future. Now it was Steve to listen, he fetched everybody exactly at the place where he or she was standing, took them with him in the argument, left space, respected, inspired, motivated, accompanied, and stimulated. Until we almost missed dinner -

On this evening Steve humbly and generously shared his insight, and vision - as much as in his innumerable academic lectures on community driven epidemiology, on environmental justice, or the perspectives of epidemiology in public health, in his public lectures, in discussions with scientists from epidemiology, medicine, the social sciences, in communication with affected people and their organizations, his appearances in court, expert statements to juries, with neighbors and it is private circle of friends.

Steve played jazz piano in a restaurant in Raleigh– I went there for lobster and steak – but as much for the music during my time in Chapel Hill. He played a bunch of other instruments. No big deal, as he put it, for someone born in New Orleans, as he was. My children loved to be with him in his music room in the beautiful wooden home in the middle of the woods of Pittsboro. Loved to sing, to play, and to laugh – and of course his legendary steaks, Cajun style, artfully prepared in his barbecue house in the garden. The steaks, also, will remain in our memories.

Steve's wife Betsy and his daughters Ann and Marion had set up a blog in the Internet to keep his friends and colleagues in many countries over the world posted about his medical treatment, state of mind, and continuing professional activities. Everybody who felt close to him could follow the blog, and share concerns, wishes, and hope for Steve's health. On November 9th, his family posted:

"It is with great sadness that we write this. Steve died peacefully this morning at home with Betsy, Ann and Marion at his side. His five weeks at home with hospice care were filled with sunshine, happy visits with friends and family and an amazing ability to remain engaged with the world in spite of rapidly declining health. It wasn't until the last couple of days that it became evident that he wasn't going to be here much longer.

Although many of you did not get the chance to see Steve one last time, please know that he felt sustained by the care and love of his communities near and far. Your support continues to bring us comfort as we move along in this journey. We are thankful to know that the strong, just and kind man whom we knew as a loving husband, father and grandfather was also so admired in his roles as a friend, musician, mentor, academic and community activist."

Steve Wing has passed away. He was a great scientist. He has pushed epidemiology over its narrow conceptual limits, reopening it to its sincere inner public health core and heart, reclaiming its responsibility for the people's health, concerns and needs. He has contributed to answer important research questions. He has demonstrated to all of us that it is possible at the same time: to be an academic, a teacher, a scientist, an advocate, an activist – maintaining curiosity, respect, and a positive attitude. We had the privilege to know him – this *strong, just and kind man*. But now he also urges us to continue the work, which in the very end, he could no longer pursue himself.

Wolfgang Hoffmann