

Citation for Honorary Fellowship of the Society for Radiological Protection

Professor Jan Pentreath

Richard John (Jan) Pentreath is a Professor Emeritus of the University of Reading. Born in Mousehole, Cornwall, Jan gained his BSc at Queen Mary College, University of London (1965); his PhD, having won a Commonwealth scholarship, at the University of Auckland, New Zealand (1968); and his DSc from the University of London for his research on radioactivity in the marine environment (1980). Jan is a Chartered Biologist and a Chartered Radiological Protection Professional, a Fellow of the Institute of Biology and a Fellow of SRP. He has also received Honorary DSc degrees from the Universities of Hertfordshire, the West of England, and Plymouth, in recognition of his distinguished contribution to environmental sciences.

Jan began post-doctoral research in 1968 at the MAFF Fisheries Radiobiological Laboratory (FRL), Lowestoft, Suffolk, UK, studying the accumulation and metabolism of fission and neutron activation products by marine organisms. He led many studies relating to the distribution and chemical behaviour of radionuclides discharged by Windscale (Sellafield), Dounreay, and other sources. At the time, scientific knowledge of the behaviour of radioactivity in the environment was very limited. Jan and his team undertook ground breaking research, particularly in relation to the transuranium nuclides. Amongst his personal highlights he has always been pleased to have detected neptunium in the Irish Sea, which previously had only been seen in the Pacific, near nuclear weapon test sites; discovering that lobsters took up the novel element technetium more than any other marine animal, and proving through laboratory experiments that this was because they accumulated it directly from sea water to such an extraordinary extent; and anticipating, and then demonstrating, that high shellfish consumers received higher doses from polonium than they did from plutonium discharged by Sellafield. Indeed it transpired that polonium arising from the discharges of the neighbouring phosphate plant at Whitehaven were to prove a major source of exposure for some considerable time. This last demonstration was made long before studies on “naturally occurring” radionuclides and NORM became widely recognised as important issues in radiological protection.

These and many other studies helped provide the basic scientific background for estimating human and biotic exposures relating to such sites. Other work helped to evaluate the consequences of deep-sea disposal of low-level packaged radioactive wastes for both people and the deep sea environment itself. And, in attempting to put such information to positive use, he was also a member of an international team examining (successfully in his view) the feasibility of the sub-seabed disposal of high level radioactive wastes in the mid-oceanic tectonic plates.

Jan's pioneering work on radiological protection and the environment culminated in his being invited to lead the drafting of what became ICRP Publication 91, *A Framework for Assessing the Impact of Ionising Radiation on Non-human Species*. This approach helped bring the RP system, previously focused uniquely on humans, into line with modern environmental legislation, and to provide the tools necessary to demonstrate positively, in a defensible scientific way, that the environment was protected under planned exposure

situations, and could be protected or sensibly managed in relation to existing or emergency exposure situations.

Jan has held many senior and leadership positions in environmental scientific organisations. He was Head of Research at FRL, then Head of MAFF's Aquatic Environment Protection Division. He was appointed Chief Scientist, Director of Water Quality, and Head of Pollution Control of the National Rivers Authority when it was created in 1989 until it became one of the formative bodies of the Environment Agency (EA) in 1995 and then, until retiring in 2000, he was the EA's Chief Scientist and Director of Environmental Strategy. Throughout this period he had, at various times, also been an Honorary Professor at the University of East Anglia, a Visiting Professor to Imperial College, University of London, and a Council Member of several UK scientific bodies and served on numerous IAEA and OECD/NEA working groups.

He then, in supposed retirement, joined the research team at the University of Reading (Environmental Systems Science Centre, School of Physics and Mathematics), part time, and returned to studies of radiation and the environment until retiring, yet again, in 2006. Whilst there, as a result of drafting ICRP 91, he became a member of the Main Commission of ICRP in 2003 and was the founding Chairman of its Committee 5. He helped draft ICRP 103 and was the principal author for ICRP 108, with all of its new concepts and frameworks, and then of their application in ICRP 124. He was made an Emeritus member of the Main Commission in 2015. During this period he was also one of the independent members of the UK Atomic Energy Authority's Board Assurance Committee on Safety, Health and the Environment, and then a non-executive Director of Research Sites Restoration Ltd that was responsible for the restoration of the Harwell and Winfrith sites up until 2015.

As can be seen, Jan has had a very active retirement! He is still currently an Honorary Research Fellow at the Plymouth Marine Laboratory and an Emeritus Research Fellow of the Centre for Environment, Fisheries and Aquaculture Science, Suffolk. And he is still working on trying to improve our RP system! He has always considered that RP should be based on a knowledge of the effects of radiation on all living things, and that this knowledge should be used for their protection, as well as ours, under all exposure situations over which we have control. Readers may have seen his recent JRP article on radiation exposure of animals undergoing radiation diagnosis and treatment in relation to veterinary medicine. This has led to the ICRP asking him to chair a new group on the subject, and this work will soon be underway. So there are even more contributions yet to come from him!

Jan has made, and continues to make, an outstanding contribution to the science which underpins our radiological protection system. He is very deserving of Honorary Fellowship of the Society.

Joe McHugh OBE