

Vale Jack Warner

Former Chief of the CSIRO Division of Cloud Physics

Jack Warner trained as an electrical engineer, and was part of the CSIRO Radiophysics war effort in the development of radar during WWII, but it is his contribution to the burgeoning field of cloud physics after the war for which he will be best remembered.



Born in New Zealand in 1917 to parents who had migrated from England, Jack moved to Australia with his family when he was young, and graduated from the University of Sydney just as CSIRO was creating its Division of Radiophysics. After a stint in both the UK and the USA acting as Scientific Liaison Officer for CSIRO, he returned to Australia to work on radar. The Chief at the time, Taffy Bowen, saw the potential for radar as a means of measuring rainfall, and formed a section that was interested in clouds. In 1946, when two scientists from General Electric showed that cloud properties could be changed by adding silver iodide, and that the cloud could possibly be made to rain, a whole section on cloud physics was created in CSIRO, and Jack was one of the inaugural members.

His scientific interests lay in cumulus clouds – the characteristics of the updrafts that gave rise to them, their water content, and the entrainment of air from outside the cloud. Many of his early papers form the foundation for lectures in university courses on cloud physics even today, and his research searching for links between extra cloud nuclei from burning sugar cane and changes in rainfall preceded the current interest in the effects of man-made aerosols on clouds, rain and climate by about 40 years. The group was fortunate to have access to RAAF aircraft, and Jack's design skills combined with talented CSIRO workshop staff resulted in the first measurements of updraft velocities from aircraft.

The CSIRO Cloud Physics section was recognised as being one of the premier research groups in the new field of cloud physics in the world, with many of the seminal papers on cloud physics being written by Twomey, Warner, Squires, Fletcher and Bigg, and later Mossop. When Bowen stepped down as Chief, it was logical to separate out the section into a small Division of Cloud Physics, with Jack as the inaugural Chief.

As a leader, he was renowned as a man of few words – taciturn but non-nonsense and very direct, a little difficult to get to know, but one whose judgment was universally respected. He was a genuine intellectual with

interests in classical music, literature, sculpture, ceramics, and art, presumably inherited from his father who had been a professional artist. But he could be dismissive – when a colleague professed an admiration for the music of Mozart, the response was 'Mozart! Tinkle, tinkle'. He ran the Division in a very informal way – morning and afternoon tea in the courtyard were rituals to be observed, and were far more effective as communication vehicles than any staff meeting could be. He chose good people, and was able to give them enormous freedom, a feature he often lamented he saw lacking in the CSIRO of latter times: his days as Chief were halcyon days for research all around the world.

He also recognised the connectedness inherent in good science and ensured that his Division had strong links with both the national and international research communities. His national connections included a close tie with Monash University through Professor Bruce Morton. Those ties extended from professional interactions to an enduring friendship between him and Morton based on common interests ranging from art to bush-walking.

Under Jack, cloud seeding science in CSIRO was taken to a higher level of rigour. Whenever cloud seeding was being considered, he made sure three fundamental questions were asked:

- were there clouds with the right properties for seeding?
- did they occur often enough to be able to create a measurable increase in rainfall?
- was the rainfall increase likely to be economically valuable?

Because of his strong advocacy for cloud seeding to be tested by the most rigorous science possible, he was seconded to the World Meteorological Organization for a year to head up the group designing and executing a cloud seeding demonstration project in Spain. Many of the international scientists stationed at the site in Valladolid have very fond memories of the straight-talking, no-nonsense Australian whose impeccable scientific record had preceded him.

He returned to Australia briefly before reaching the CSIRO retirement age of 65, at which point he moved to the National Center for Atmospheric Research in Boulder, Colorado, spending his time designing and testing a new radiometric instrument designed to remotely measure the liquid content of clouds. This instrument was based on the principles of tomography, so in some sense he had gone full circle. He was using his original electrical engineering training to measure the fundamental properties of cumulous clouds based on the principles of tomography (used daily now in CAT scans) invented by a fellow Division of Radiophysics astronomy colleague, Ron Bracewell, 30 years earlier.

Jack then retired (again) from NCAR at age 70 and returned to Australia. He took up wood turning and constructed the most exquisite wooden boxes and bowls from unusual timbers. In this phase of his life he gave vent to his creative artistic skills, and many of his friends have examples of his talent

displayed prominently on shelves. Unfortunately, this creative period had to come to a halt when macular degeneration made using power tools too risky, at the same time depriving him of the precious ability to read.

Jack passed away in Melbourne on the 4th of October, aged 91. He is survived by his wife Catherine.