

# Engineers Australia - Water Engineering 'Hall of Fame'

## David Herbert Pilgrim, AM (2-12-1931 – )



David Pilgrim graduated from the University of New South Wales (UNSW) in 1953 with a first class honours degree in Civil Engineering and the University Medal. He spent five years working as a Design Engineer with the (then) NSW Water Conservation and Irrigation Commission, before joining the School of Civil Engineering (UNSW) as a Lecturer in 1958. So began David's outstanding academic career in hydrology and water resources.

His early research produced new insights on the runoff response of catchments under rainfall. His PhD ["The development of a radioactive technique for tracing surface runoff on a small catchment", 1967] brought him international recognition in this area. The linking of his tracer studies with recognized flood routing procedures was an important contribution.

David's ongoing research interests focused on development of design flood procedures, including methods for small to medium sized rural catchments, extreme floods, losses, runoff-routing models, and rainfall temporal patterns. Much current Australian

design practice is based on this work.

The quality of his many publications, contributions and achievements has been widely recognised. For instance, his Doctor of Science from UNSW in 1984 was awarded for published papers under the theme "Studies in flood hydrology and the modelling of runoff". He is a two-time winner (1982, 1986) of the Warren Medal, awarded each year by The Institution of Engineers Australia [IEAust] for the best engineering paper. He was invited to give the 1988 Unwin Lecture at The Institution of Civil Engineers, London; this annual event is to honour 'a significant person or achievement'. In 1991 he was the Munro Orator at the Hydrology and Water Resources Symposium in Adelaide. When he received the Ray K Linsley award from the American Institute of Hydrology in 2002, he was only the second person outside the USA to be accorded the accolade.

His 'service to science, especially hydrology' was recognized by the award of Member of the Order of Australia (AM), in 1988.

### David Pilgrim's major professional achievements

#### *Education and university*

David spent thirty five years as a staff member of UNSW, the last seven as Professor and Head of the Department of Water Engineering, a group which has long been pre-eminent in research and post-graduate training in Australia. In the latter category, the University's three-month Graduate Course in Hydrology was of particular note, training over 600 students from 44 countries and all Australian states in the period from 1960 to the mid 1990s. This course had a major impact on water resources and hydrology in Australia; a large percentage of senior workers in these fields received hydrological training there. David was in charge of the Graduate Course for most of this period, in addition to having general responsibility for the graduate research program in the Water Department (PhD, ME,

and course-work Masters degrees). It should also be noted that David (and colleagues) provided many workshops and seminars for practicing engineers.

Mention should be made of David's role in the development and operation of the School's network of instrumented research catchments ranging in characteristics (part rain forest to the arid zone). This provided a practical and "hands on" background to his (and his colleague's) teaching and research in hydrology.

During his career, David was active in many external academic activities (including paper reviews, journal editorships, reviews, examining, and consulting), professional contributions (including membership –also chair - of the EA National Committee on Water, IAHS, UNESCO). He was also a founding member of the Council of the Macarthur Institute of Higher Education, becoming Chairman before its incorporation into the University of Western Sydney.

### ***Australian Rainfall and Runoff [ARR]***

*ARR*, published by IEAust, has been regarded as *the* authoritative publication in flood estimation since the first edition in 1958. With rapid advances in hydrologic knowledge, a second edition was produced in 1977. In 1982, the Institution requested David Pilgrim to lead a team (mostly from the School of Civil Engineering, UNSW) to completely revise and rewrite the document. This was a five-year project, with extensive interaction with the profession throughout Australia. It included development of design rainfall data for Australia by the Bureau of Meteorology, and derivation of flood design data by Government authorities in most States. The overall project involved work to the value of about \$4 million (1987 costs), and produced a document that has endured. The re-published versions in 1998 and 2001 include a revision of Chapter 13, but all other chapters remain unchanged. The 1987 *ARR* was published in two volumes, the second composed mainly of maps of design rainfall prepared by the Bureau of Meteorology and some other design maps and charts.

David contributed greatly to the first (and main) volume of *ARR*, not only as its Editor-in-Chief, but also as the author of Chapters 1, 5, 7, and 9 and co-author as several others (3, 10, 12, and 13). It is a tribute to David and his revision team that *ARR* was the 1989 Sydney Division winner and 1990 National Winner of the IEAust. Excellence Awards in the category "Engineering Reports, Procedures and Systems"

[Currently (2009) *ARR* is in the process of a major revision to incorporate advances in hydrologic knowledge since the mid 1980s.]

### ***Some Key Publications***

*Australian Rainfall and Runoff – a guide to flood estimation*, The Institution of Engineers Australia, 1987. (D H Pilgrim, editor and author. See above)

D.H. Pilgrim and I. Cordery, Flood runoff. In Maidment, D.R., (ed), *Handbook of Hydrology*, Ch. 9, New York, McGraw-Hill, 1992, pp. 9.1-9.42.

D.H. Pilgrim, Some Reflections on Australian Hydrology. Munro Oration, Hydrology and Water Resources Symposium, 1991, Perth, Inst. Engrs Aust., 1991, 23p.

D.H. Pilgrim and G.E. McDermott, Design Floods for Small Rural Catchments in Eastern New South Wales. Civil Eng. Trans. Inst. Engrs. Aust., 1982, Vol. CE24, pp. 226-234. [*Warren Medal*]

D.H. Pilgrim, Estimation of Large and Extreme Design Floods. Civil Eng. Trans. Inst. Engrs. Aust., Vol. CE28, 1986, pp. 62-73. [*Warren Medal*]

D.H. Pilgrim, Radioactive Tracing of Storm Runoff on a Small Catchment. Part 11 - Discussion of Results. Jour. of Hydrology, 1966, Vol. 4, pp. 306-326.

D.H. Pilgrim, Travel Times and Nonlinearity of Flood Runoff from Tracer Measurements on a Small Watershed. Water Resour. Res., 1976, Vol. 12, pp. 487-496.

D.H. Pilgrim, Bridging the Gap Between Flood Research and Design Practice. Trends and Directions in Hydrology, Water Resour. Res., Vol. 22, 1986, pp. 165S-176S.