

CENTREFOLD

Alex McNabb **Elected as a Fellow of the Royal Society of New Zealand**



In May of this year, Dr Alex McNabb was elected to a Fellowship of the Royal Society of New Zealand. Alex is section leader of the Mathematics Physics group of Applied Mathematics Division, Department of Scientific and Industrial Research, Wellington, which is located on the Victoria University campus.

Alex McNabb is one of New Zealand's leading applied mathematicians and in the area of continuum mechanics he is clearly one of the best known New Zealanders both here and overseas. His contributions both to the theory and application of mathematics, especially differential equations, has given rise to the high regard accorded his work by a widely diverse group of scientists. He is the author of nearly 50 papers in applied mathematics.

On the practical side Dr McNabb has made notable contributions to a multitude of diffusion-type problems. These are a host of different applications: timber treatment, moisture in soil, heat and moisture in wool, hydrogen in metals, and, more recently, flow and diffusion in geothermal applications. He has been crucially involved in the theory of hydrothermal systems as they appear in New Zealand and he, assisted by his colleagues at Applied Mathematics Division (D.S.I.R.), have made important contributions to our understanding of these phenomena. The same is true of his work for New Zealand Steel on the smelting of iron sand. Notable amongst this work has been his 1963 contribution on the diffusion of hydrogen in iron and steel—his paper on this subject was denoted as a Science Citation Index Classic in 1983. All of these applications involve a careful study of usually non-linear processes involving non-linear differential equations.

No doubt motivated by the common mathematical problems which arise in these diverse applications, Dr McNabb has made very significant contributions to the theory of differential

equations. In isolation, some people would regard this as pure mathematics but the use of these results is too vast for the work to be regarded as just pure mathematics. His early work on comparison theorems for coupled equations is widely quoted in major texts on the theory of differential equations. More recently his work on the factorisation of operators is indeed highly significant with wide applicability. A series of papers on this topic, initiated while he was a visitor to the University of Southern California in the late sixties, has appeared and work along these lines is still proceeding. The idea involved is very useful—it shows how to solve an equation in operator form by splitting it into a number of easily computable steps. Thus this work has both a theoretical and practical significance.

This unusual mix of interests of both theory and practice is a distinctive feature of Dr McNabb's work. He has shone light on a greatly diverse number of areas and is rightly regarded as one of the leading figures here in New Zealand in the area of continuum mechanics. His publication list does not include of course the major contributions he has made via suggestions etc. to numerous co-workers in a host of institutions here and overseas. Not least has been a very large number of research students and younger scientists who have sought inspiration from him on how to tackle the problem of the day. More often than not, Alex has provided more than one suggestion that will work. He is well-known as the best person to ask on a host of problems that arise in applied mathematics. The contributions he has made, often quite casually and seldom published by him, are very significant and bear witness to the considerable influence he has had, and continues to have, on applied mathematical research. Also we must refer to vast numbers of contributions Dr McNabb has made to geothermal work via the geothermal circulars which have never been formally published. Therein can be found a comprehensive model of a geothermal system.

Alex has been a member of Applied Mathematics Division since 1954. Before that, he gained a M.Sc. with first class honours in Mathematics from Canterbury University College. He was absent on leave from D.S.I.R. at Cambridge University 1954–1957 where he gained a B.A. in Mathematics. In 1971 Victoria University of Wellington awarded him, in recognition of his major contributions to Applied Mathematics, a D.Sc. in Mathematics. He served one term on the Council of the N.Z. Mathematical Society and is a keen supporter of its activities. Alex's interest outside Mathematics and its applications, centre around his notable exploits as gymnast (N.Z. Champion 5 times 1948–1962 and British Universities Gymnastic Champion 1954) and recently as a gymnastics coach. His mathematical talents are recognised here too, as he includes in his many distinguished appointments that of "honorary lecturer in the mechanics of gymnastics".

The mathematical community congratulates one of its distinguished members on his election to the Royal Society Fellowship and firmly believes the addition of another active mathematician to its Fellowship (total now eight mathematicians) will greatly enhance the activities of the Royal Society.

Graeme C Wake