Preface to a special issue dedicated to the memory of Prof. Peter Chadwick FRS

This special issue has been prepared as a tribute to the memory of Professor Peter Chadwick, who passed away on 12 August 2018 at the age of 87. Peter had considerable influence on the development of his subject over a period of more than 30 years and provided much support to a generation of researchers and colleagues.

Peter graduated in mathematics at the University of Manchester in 1952 and his PhD from the University of Cambridge, Department of Geodesy and Geophysics, was completed in 1957. He was a scientific officer, subsequently promoted to senior scientific officer, at the Atomic Weapons Research Establishment at Aldermaston (AWRE) between 1955 and 1959, working mainly on problems in geophysics. He then moved into academia on appointment as a lecturer, then senior lecturer, in applied mathematics at the University of Sheffield where he pursued research in theoretical solid mechanics until 1965. He was appointed as a professor of mathematics at the University of East Anglia (UEA) in 1965, where he remained until his early retirement in 1991 at the age of 60 on health grounds.

Peter made an enormous contribution to the development of research in theoretical solid mechanics during his tenure at UEA, where he established a unique supportive environment for fellow academic staff, postdoctoral researchers, students and visitors. His personal research included a diversity of topics within continuum mechanics, but his most important contributions were to the propagation of elastic waves, in particular surface and interfacial waves, and to the thermomechanics of rubberlike materials.

A detailed description of Peter's life and work is provided in the memoir [1].

The collection of papers presented here covers a broad range of themes in solid dynamics, including multi-field effects in both linear and nonlinear elasticity. The majority of the authors were fortunate to have enjoyed collaborations and interactions with Peter in various capacities. The papers by Barnett, Darinskii and Shuvalov, and Fu et al. [2-4] are in the area of Peter's primary research interest related to the most general treatment of surface and interfacial waves. In particular, Barnett revisits the problem of existence of surface waves with the wave polarization vector lying in the half-space boundary when the Stroh formalism exhibits semi-simple Stroh degeneracy. Darinskii and Shuvalov applied the classical Stroh formalism to study interfacial acoustic waves localized at the internal boundary of two different perfectly bonded half-spaces made of periodically layered or functionally graded anisotropic elastic materials. The paper by Fu et al. originates from Peter's representation of the surface wave of arbitrary profile in terms of a single harmonic function, and presents a reduced model equation describing the surface dynamics of a general anisotropic elastic half-space. Visco-and electroelastic phenomena are investigated in the papers by Scott [5] and Dorfmann and Ogden [6]. The first paper is focused on the analysis of energy flux, while the second one considers waves and vibrations in a finitely deformed flexible tube. The paper by Destrade et al. [7] is also in the field of non-linear dynamics dealing with 2D shear wave propagation under finite deformation. The papers by Andrianov et al. [8] and Sharma and Mishuris [9] report on recent advances in lattice dynamics, taking into account non-linearity and damage, respectively. Low-frequency elastic wave cloaking is the subject of the paper by Norris and Parnell [10]. The topic is examined

with the aid of the impedance matrix approach that also has its origin in the Stroh formulism. Thus, this special issue presents a state-of-the-art in a number of topics that were close to Peter's heart, and is dedicated to the fond memory of a great pioneer in wave propagation.

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Julius Kaplunov
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