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Jules Kieser (1950–2014)

Professor Julius August Kieser (known as Jules) who died suddenly on 10 June 2014 at the age of 63, was inaugural Director of the Sir John Walsh Research Institute, Faculty of Dentistry at the University of Otago, New Zealand. He was an internationally renowned forensic scientist, oral biologist and dentist, an expert in the fields of odontometrics (the measurement of teeth), craniofacial and dental anatomy, forensic biomechanics and forensic odontology. Jules Kieser was dedicated to the pursuit of science in both forensic science and dentistry and his work has influenced a wide variety of disciplines, including ultrastructure of dental tissues, comparative dental anatomy, tooth development, size and shape of teeth, craniofacial embryology, genetics, saliva and human growth. His influence on forensic science is also substantial including inter alia the biomechanics of trauma, bacterial fingerprinting of bite marks and marine decomposition. Moreover, he collaborated with experts in anatomy, bio-engineering, Parkinson's disease and Brain Research, dentistry, mechanical engineering, crime laboratories and forensic science. Jules wrote five books on odontometrics, oral biology, practical anatomy, dental genetics and forensic biomechanics that have been reprinted, edited and translated (Kardos & Kieser, 1998; Kieser, 1990; Kieser & Allan, 1999; Kieser & Kramer, 2007; Kieser et al., 2013). Other publications number around 200 research articles and many chapters. He supervised a generation of students in

anatomy, archaeology, anthropology, forensic biology, forensic identification, dental ageing and zoology. He was an internationally renowned teacher and ran popular short courses and workshops on clinical anatomy and forensic biology across the world.

Jules Kieser was born on 20 December 1950 and educated in Pretoria, South Africa. Both his grandfathers were surgeons. He obtained a BSc majoring in anatomy from the University of Witwatersrand in 1971, followed by a Bachelor in Dental Surgery in 1975. During this time, he was also a demonstrator in anatomy. After completing his compulsory Army year, he went into general dental practice, first in rural South Africa, then a year in London, returning to Johannesburg and continued part time until 1996. In 1985 he joined the Department of Orthodontics as a clinical lecturer and later returned to the Anatomy Department to undertake a PhD supervised by Phillip Tobias entitled “*Factors in tooth formation, with special reference to Carabelli's trait, allometry and fluctuating odontometric asymmetry*”. In 1990, his first book “*Human Adult Odontometrics the study of variation in adult tooth size*” was published, and it remains one of the most comprehensive and critical reviews of the measurement, inheritance, variability and understanding of human tooth size with an impressive appendix of published data. In 1991 Jules was appointed Reader of Craniofacial Biology in the Department of Oral Pathology and in 1994 Honorary Professor of Anatomy. During these years, he also served as a consultant for several medical aid administrators and was a regular guest on a local radio station presenting “Dentally Speaking”.

In 1996 the Kieser family made their home in Dunedin, New Zealand where Jules was appointed Chairman of the Department of Oral Sciences and Orthodontics in the Dental School, University of Otago. In 1997 he was selected as Associate Dean for Research at the Faculty of Dentistry. He kept his academic links with the University of Witwatersrand and obtained his DSc in 2001 with a thesis entitled “*Studies on the teeth and jaws of humans and other animals*”. In 2009 Jules was appointed inaugural Director of the Sir John Walsh Research Institute, Faculty of Dentistry at the University of Otago.

Jules Kieser's published works span numerous disciplines each displaying an impressive breadth of knowledge, enthusiasm and energy. Themes he would return to with an array of co-authors include anatomy of the oro-facial region, dental anatomy, tooth size and shape, clinical dentistry, oral physiology, contributions to oral pathology, orthodontics,

dental materials and dental implants. Other topics include comparative osteology and dental anatomy of past human populations and dental anatomy of nonhuman primates, mammals and reptiles. Forensic topics include the biomechanics of non-ballistic wounding, blood splatter and marine decomposition.

He published his first paper as a dental student on anatomy, a theme he would return to with papers on the clinical evaluation of the muscles of mastication, the morphological pattern of the mental nerve, the intrabony course of the inferior alveolar nerve in the edentulous mandible, basicranial flexion and glenoidal morphology in humans, a model of the human masticatory system, analysis of chewing activity, allometric relations of teeth and jaws in man, and the temperomandibular joint. His papers in dental anthropology explored tooth size and morphology, fluctuating odontometric asymmetry, tooth dimensions in Down Syndrome, tooth size and maternal alcohol consumption and smoking, a biomechanical analysis of the canine tooth shape, risk factors for deciduous tooth wear, age estimation from developing teeth, dental age of Maori adolescents, tongue and intraoral pressure during swallowing, prevention of oral barotrauma associated with scuba diving, the oral health status of Lengua Indians of Paraguay, facial fractures, tongue piercing and oral trauma in New Zealand. Other papers relate to past populations including a CT study of a mummy, the premaxillary suture in early Polynesians, oral pathology and dental wear in early Maori, the early Griqua dentition and other ethnic groups of skeletal remains in southern Africa and the variability in shape of the dental arcade in *Homo sapiens* in late Pleistocene and modern samples from Southern Africa.

Comparative anatomy was always well represented including multivariate sexing of the viscerocranium in the vervet monkey, the dentition and dental tissues of Chacma baboon, tooth size in baboon, galago, African wild cat, African wild dog, cheetah, bat-eared fox, dolphins, cranio-dental allometry and comparative morphology of the mandibular-dental complex in wild and domestic dogs, sex allocation of skeletal material using the proximal tibia, body size and carnassial length in modern and fossil carnivores, toothed whales, heterodonty and patterns of tooth replacement in crocodiles, tuatara (a reptile) and one paper on ornithology.

Jules' forensic papers encompass diverse topics including sexing of the viscerocranium, gunshot induced indirect femoral fracture: mechanism of injury and fracture morphology, animal model for rib fracture patterns, morphoscopic analysis of experimentally produced bony wounds from low-velocity ballistic impact, forensic entomology, indirect ballistic fractures, isolation and genotypic comparison of oral streptococci from experimental bitemarks, the biomechanical approach to human bitemark reconstruction, forensic evidence in apparel fabrics due to stab events, analysis of experimental cranial skin wounding from screwdriver trauma, the deer femur: a morphological and biomechanical model of the human femur, the biomechanical modelling of non-ballistic skin wounding: blunt force injury, microbial analysis of bitemarks and detection of gunshot residues.

Jules was very active and successful in obtaining research grants to fund projects with around fifty colleagues and

students, a testament to his ability to communicate and collaborate with both experts and students. He was involved with successful grant awards in a wide range of topics not mentioned above, which include bioengineering applications of musculo-skeletal modelling (joint principle investigator \$1 m), biomechanics of the mandible and development of the human chin, functional significance of strain distribution in the mandible during mastication, pain predictors during orthodontic treatment, treatment of dry mouth with microemulsions, effect of sodium hypochlorite and casein phosphopeptide-amorphous calcium phosphate on hypomineralised enamel in molar-incisor hypomineralisation, tongue pressure dynamics during eating and swallowing, tongue pressure dynamics and mandibular morphology, wireless monitoring of intraoral pH and bruxism, management of xerostomia following radiotherapy, oral health of older people, effects of denture-induced gingival pressure on bone resorption, the effect of food consistency on the microstructure of the articular tissue of the temperomandibular joint in Kune Kune pigs and 3D Imaging of pre-contact Maori skulls. Grant awards for forensic topics include psychological factors in the analysis of bloodstain evidence, molecular microbiology of bite marks using high-throughput DNZ sequencing, Streptococcal DNA identification techniques, detection of oral microflora for the identification of extirpated blood, forensic application of restriction fragment length polymorphism comparison of oral streptococci, effect of seawater degradation on DNA from teeth, a model to study firearms related bloodspatter and backspatter of blood from cranial gunshot wounds. Other grant awards relate to student approaches to learning in basic oral science, interactive computer model cranial sensory nerve physiology, teaching technology grants for dissection of the neck and context rich problems in oral biology teaching, learner centered experience in Oral Biology.

Jules was an innovative and inspiring teacher and could entertain non-specialists and specialists alike with his narrative style, his passionate curiosity of the natural world, and his enthusiasm for sharing his extensive knowledge and interests. He inspired a generation of students around the world, teaching anatomy (with risqué mnemonics), tooth development, oral physiology, oral biology and craniofacial biomechanics. He supervised around 75 PhD and other graduate theses and in particular encouraged students to present at national and international meetings. On a personal note, he inspired me to become a dental researcher and it was he who emailed me from Thailand after the December 2004 tsunami, asking which method of dental age estimation was best. It became clear there was a need for an accessible, easy atlas of tooth development, which is now available online and being used around the world.

Jules also served the University of Otago convening numerous academic reviews including the Physiotherapy School, Graduate Services, Department of Medicine (Wellington), Departments of Zoology, Health Sciences Postgraduate degrees, Physiology, Department of Information Science, School of Maori Studies, BSc Degrees, Anatomy and Structural Biology. He was a founder member of the Australia New Zealand dental education network for teaching and learning. Jules was an active

member of the International Organisation for Forensic Odonto-Stomatology and served as editor of the Journal of Forensic Odonto-Stomatology 2008–9 dealing with the transition from paper to online format.

Jules was an active member of numerous professional societies and associations including the Craniofacial Biology group of the International Association for Dental Research, the New Zealand Dental Association, the New Zealand Society for Forensic Dentistry, Forensic Science Society, the Otago Medical School Research Society, Dysphagia Research Society, American Association of Anatomists, American Association of Physical Anthropology and Dental Anthropology Association. He was also very active in the ANZ dental education network for teaching and learning and the Biomouth research group.

Jules Kieser was the recipient of numerous awards and honours including fellowship of the Faculty of Maxillofacial Pathology, Royal College of Pathologists of Australasia, the Sir John Walsh Research Institute Clinical Research Award, Fellowship of the International College of Dentistry, Alan Docking Award for International Association for Dental Research, Honorary Fellowship in Dental Surgery, Royal College of Surgeons (Edinburgh), Fellowships of the Linnean Society and the Galton Institute. His forensic work was recognised with awards from the New Zealand Special Services Medal (for services during the Thai Tsunami) and

New Zealand Commissioner of Police Commendation (for forensic identification in the Christchurch earthquake), as well as Fellowship of the Forensic Science Society. Most recently, he was awarded a Wits Distinguished Scholar and Wits-Carnegie Alumni Diaspora Fellow from the University of the Witwatersrand, South Africa.

Jules Kieser is survived by his wife, Glynny (who played an important part in supporting his writing and editing his work), four children (Annie, JJ, Daniel and David) and five grandchildren.

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Personal note from the Editor:

I first met Jules Kieser when I arrived at Phillip Tobias' Department of Anatomy at the University of the Witwatersrand to take up a senior lectureship in 1984. Jules was outgoing, ebullient, amusing, a multi-skilled academic, inspiring teacher, innovative researcher, and a lover of rugby, braai, and his family. It came as no surprise that as post-apartheid South Africa was finding its way through a new democracy Jules should decide that his next academic challenges, and his family's future, could best be served through a new adventure in New Zealand. Jules quickly established himself as a leading dental practitioner, intellectual and researcher and has left an indelible mark on New Zealand dental research and forensic medicine. I was to join Jules at the

Sir John Walsh Research Institute in 2015 as a Visiting Fellow – a position that he had been encouraging me to apply for since 2007. We were to work on the dental maturity of New Zealand children and I know that we would have had a great deal of academic, and non-academic, enjoyment. Whilst Jules will always be associated with dental research he was also an innovative and energetic human biologist. His legacy in methodological advances, primary research output, doctoral students, and global research is immense and he will be missed by his colleagues and students both nationally and internationally.

Noël Cameron
Editor, Annals of Human Biology