

Moments that mattered: stumbling towards nutritional science

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That I *'thrived on difference'* is my epitaph. My Swedish grandfather had insisted that our name be spelled with 'qv'. This was provocatively different in English-speaking Australia where, not only was that regarded as a mistaken 'qu', but it was not to be pronounced 'kv' as in Swedish. Nowadays in Sweden, spelling is more phonetic and unambiguous for non-Swedish speakers, but too late for my emigrant grandfather and his adopted countryfolk. That small point has shaped my life, made me feel different, be accountable for who I am, encouraged me to be interested in the unusual, to be more tolerant than I otherwise might have been, querulous, and for the past to inform my future. By no design, I have been amenable to a cross-cultural life and career, partly in science. Both my grandmothers (one Cornish, the other German) loved books and story-telling, believed in me come-what-may, and insisted on the pursuit of education to pave the future. Not only did geographical and ancestral incongruity matter, so did the moment. I was born during the second world war, in 1942, to parents who had felt keenly the great depression and where rationing of resources still prevailed. Our family grew most of its own fresh fruit and vegetables, had hens for eggs not meat, ate rabbits which plagued the country and were caught or cheap, went camping, fishing, blackberry-and-olive-picking for fun and food, had freshly baked wholemeal bread, and queued for other foods in shortage since these were exported to post-war Europe, including to our own relatives. We cooked, preserved and recycled food in tasty ways. Food waste was discouraged. But would that nominal idiosyncrasy have mattered today? Now being registered for residency in Chinese-speaking localities by my name in Chinese characters, not Roman script, probably not.

Nutritional concepts found their way into my primary school days as the *'Five*

Food Groups' which I perceived as serving sectoral commodity interests, were somewhat incoherent, and I argued with my teachers about it. Within this framework, Australian children were given milk each school day in the conjoint interests of the dairy industry and child health. This coloured my thinking for years to come. My best friend in primary school was a Ukrainian refugee boy; we both felt difference from others was imposed by our European names; we had no role models for it, but agreed we might aim to be doctors- and that we did.

At **Adelaide University**, I enrolled in medicine. With a mix of altruism and the grand maternal concern for my long-term security, I thought it offered a better chance to understand life, to care about others and a more borderless career than the alternatives. Research was not a formalised concept in my head, but this soon changed. The first year exposed me to a newly introduced subject about the history of medicine, discovery and the origin of ideas. Although culturally skewed, it was inspiring. In the second year and, notwithstanding a distressingly persistent White Australia Policy, I met my future wife, a fellow medical student, Chinese and secretary-to-be of the Malaysian students' association, of which Singapore was still a part. My orientation to Asia, which began with a Korean friend in childhood, developed further. Insights into food systems and culture came through eating and cooking with my Asian university friends, from nutritional biochemistry and with the integrative concepts of physiology.

What began to bother me was the practice among some peers of perfunctory and dubious laboratory work. I became cynical about the science we were taught. I took time out to do a **Medical Science** degree and to learn how a medical science department operated. I chose physiology and studies of pathophysiology. This was a reassuring

experience. I found sound leadership, mentorship, mutual respect and robust, innovative debate in the corridors and tea-room (opportunities and space for creativity which I have consequently defended in my various administrative roles). I became involved in various projects, enjoying discovery. Inspired by the visits, writings and advice of an Adelaide medical graduate, and co-discoverer of penicillin, Howard Florey, particularly his 'inflammatory basis of disease' concept, I worked in this field through my undergraduate days and into my first doctorate. I submitted this as an MD back to Adelaide University from Melbourne University as had Florey with his Adelaide MD from abroad. They were the days when polyunsaturated margarines were being promoted and vied for market share with butter, on rather controversial grounds about the role of diet in cardiovascular disease. Against this background, I published my first scientific paper on macrophage lipid metabolism and its potential role in atherogenesis in 1964 and then through the later sixties. The science, agricultural, industrial, medical, food cultural, public health, clinical and political dimensions of this work were both surprising and instructive. The passage of time taught me more and more about the socio-political intrigues of science and academia.

It is a cliché to reiterate, but teachers often have profound and lasting influences. For me, the most positive were from my clinical teachers who were both humanists and scientists. One was the first clinical professor at Adelaide University, Hugh (Norrie) Robson, a general physician and haematologist, who had an exemplary bedside manner, diagnostic clarity, a grasp of evidence, interesting experience to relate and remember, good judgement while devoid of judgementalism, and a measure of cynicism for the pretentious. For years after I had graduated and he had become Vice-Chancellor of Sheffield and then the Rector of Edinburgh University,



Professor Mark Wahlqvist (centre) with Nutrition Society Trustees, Professor Alison Gallagher and Dr Frank Thies

he would write to enquire about my welfare. It is said that, to build a career, one needs a helping 'leg-up' at least thrice. Norrie Robson was one of those for me. By contrast, and about the same time, I had one who 'warned' me that, because of my inter-racial partnership, which he regarded as immoral, I would never get on in Medicine. I have thought a lot about these encounters in my ultimate role as a teacher too. One of the greatest rewards possible in life is to have taught, in so-doing to learn, and to achieve change-for-the-better through one's former students.

By good fortune, about the time I moved to **Melbourne University**, Basil Hetzel, a major figure in the field of iodine deficiency disorders, who had been one of my two professors of medicine in Adelaide, also moved to Melbourne, to become the Foundation Professor of Social and Preventive Medicine at Monash University. This kept me interested in metabolic medicine and population health. It also gave me the opportunity to encourage my fellow Adelaide University medical graduate Tony McMichael, then President of the

National Union of Australian University Student (NUAUS), to explore the possibility of graduate studies with Basil. Tony and I worked part-time in family medicine in the socio-economically disadvantaged district of Brunswick to the north of Melbourne, and, both newly-married, shared an apartment. This was a period of intense socio-medical interaction and re-orientation. The world was awash with student activism and a struggle against the war in Vietnam. These phenomena were the substrate and stimulus for much of our later life disposition and advocacy, as it turned out, for food, health and the planet. Life in Melbourne was also marked by the formation of the Asian Australian Family Association in 1968, a support organisation, of which I became the first president. Our first child, Ingmar Wei Tzu, born in 1969, and others like him, gave it impetus. So did the fact that the White Australia policy was not fully disbanded until 1975, after our second child, Kerstin Yih Fen, was born in 1974.

After Melbourne, Sweden was an attractive destination for family, professional and ideological reasons.

I worked between the Karolinska Institute and Hospital with its King Gustaf Vth Institute in Stockholm and the Geriatric Medicine Institute at Uppsala University. This gave me the chance to conceptualise whole body and life-course regulatory metabolism and physiology with both public health and clinical relevance-and a publication spurt! I defended an Uppsala University doctorate in medicine about the nutritional and endocrine regulation of human cardiac metabolism.

The prospect of more progressive politics in Australia in 1972 clinched a move to the Department of Clinical Science at the John Curtin School of Medical Research of the **Australian National University (ANU) in Canberra**. Here several events mattered. Professionally, as an endocrinologist-diabetologist (FRACP), I became involved in developing these services in the ACT (Australian Capital Territory). Medico-politically, I was involved in a working group with the Minister of Health, Bill Hayden, to introduce National Health Insurance in Australia, an initiative formulated by Scotton and Deeble. I served as a

physician to the Swedish embassy. My research interests became more clinical.

From the ANU, I moved to **the Department of Medicine at Monash University**, located at Prince Henry's Hospital in Melbourne and to appointments in General Medicine, Endocrinology and Diabetes. I founded a **Clinical Nutrition and Metabolism Unit (CNMU)** with responsibilities for inpatient nutrition services and for ambulatory care in nutritionally-related disorder and disease (NRDD); and developed a body composition laboratory. When fully equipped with whole body counting for potassium and in vivo neutron activation analysis for nitrogen, DEXA (Dual Energy X-ray Absorption), the second unit in Australia, and more, Dr Elsie Widdowson from Cambridge was our guest and formally opened the facility. These developments facilitated the engagement of clinical nutrition in medical education and clinical practice.

The **Australian Nutrition Foundation** (later '**Nutrition Australia**') during my tenure as Chair) was also constituted in Melbourne, initially by a small group which included Basil Hetzel, Paul Nestel, Richard Read, Joan Steele, Elsdon Storey and myself. In about 1976, **the Nutrition Society of Australia** was founded by a group including John Black, Richard Read, Delia Flint and John Court and the first conference held in Melbourne.

During 1977, I was appointed to the first **Chair of Human Nutrition at an Australian University, at Deakin University in Geelong**, some 85 kilometres from Melbourne. For nine years, the CNMU programme was joint between Monash and Deakin Universities. My former mentor, Basil Hetzel had been appointed the Director of the **CSIRO (Commonwealth Scientific and Industry Research Organisation) Division of Human Nutrition** in Adelaide. Stewart Truswell was in turn appointed to the second Chair, **the Boden Chair, of Human Nutrition at Sydney University**. So quite quickly academic nutrition science was on the ascendancy in Australia. Early in my role at Deakin, Sir Richard Doll, Regius Professor of Medicine at Oxford visited and

together we did a live "Monday Conference" on Australian TV about nutrition and cancer which set the scene for greater media coverage of nutrition science.

Deakin University Nutrition worked in concert with Sydney University and CSIRO to strengthen the capacity of human nutrition science throughout the country. It built a full-time staff of 11 with wide expertise in nutritional physiology and biochemistry, nutritional anthropology and epidemiology, food science and, especially, chemistry, food service, community nutrition, clinical nutrition and dietetics. Deakin was solely responsible for dietetic training in Victoria. Deakin also provided input and membership of the Committee for Overseas Professional Qualifications. The Deakin staff together wrote the comprehensive textbook '**Food and Nutrition in Australia**', published first by Cassell in 1981, then Nelson, now in its 36th year, by Allen and Unwin, at the interface between secondary and tertiary education. It has twice been runner-up for Australian University book of the year.

My involvement with **IUNS (The International Union of Nutritional Sciences)** began in 1981 in San Diego when I assumed the Chair of the Nutrition in Medical Education Committee. This produced a Manual of Patient Problems in Clinical Nutrition in 1987, intended for both clinical teachers and students to recognise and manage NRDD. It has been widely used, translated into Chinese and is still available on-line (http://apjcn.nhri.org.tw/server/MarkWpapers/mark_books/patient.html). The former Secretary-General of the IUNS, Professor Bjorn Isaksson and I published the case for training in Clinical Nutrition (Wahlqvist M, Isaksson B. Training in clinical nutrition: undergraduate and postgraduate. The Lancet. 1983 322:1295-7).

In 1985, I inherited the **IUNS Nutrition and Ageing** committee from Hamish Munro. We resolved to initiate a project referred to as Food Habits in Later Life (FHILL) which would (1) document food habits among older people whose food culture was at risk and which might vanish without record (2) follow a range

of longevity food cultures in disparate communities to establish whether different food patterns could allow similar survivals (3) assess the use of food cultural or diversity scores as food-health indicators among elderly people. The FHILL was developed in conjunction with the SENECA project for Europe using similar methodology. The principal publication for Greek villages provided the instrument now used in many studies of the so-called Mediterranean diet (which approximates the Cretan diet of the 1950s) (Trichopoulou A, Kouris-Blazos A, Wahlqvist ML, Gnardellis C, Lagiou P, Polychronopoulos E, Vassilakou T, Lipworth L, Trichopoulos D. Diet and overall survival in elderly people. BMJ. 1995 311:1457-60). No one nutrient or food could account as well for survival as an integral of the whole diet.

In 1987, I became Professor and Head of Medicine at Monash University, Prince Henry's Hospital and then the Monash Medical Centre in Melbourne. This strengthened the place of nutrition in medical education and practice in Australia. During this appointment, the human nutrition outreach extended further internationally in the Asia Pacific through the development of the Asia Pacific Clinical Nutrition Society and its publication of the **Asia Pacific Journal of Clinical Nutrition (APJCN)**. APJCN first appeared in 1992 co-edited by myself, Vichai Tanpaichitr (Thailand) and Akira Okada (Japan). The plan was put together in Heidelberg in 1991 at the 4th meeting of the International Symposium on Clinical Nutrition. It became an IUNS journal and, initially, a Monash electronic journal, an early venture into this publishing realm. Then, too, it published jointly with the United Nations University, its first electronic publication, the report of the IUNS FHILL project.

Over the years, it has been possible to undertake various studies of food culture and health. These began with studies of Greek migrants to Australia and how duration of stay affected diet and disease susceptibility. They continued with the FHILL studies, with those in West and North Sumatra in Indonesia to do with coconut consuming cultures and

protection against cardiovascular disease, of food practices which promoted breast feeding and prolonged lactation. The work with Batakese women resulted in me being made an honorary Batakese with the name Purba, that of my first Batakese graduate student, Martalena Purba. International activity has involved policy-making and training. Noteworthy have been programs in Indonesia through the SEAMEO-Tropmed Community Nutrition initiative supported by Australia in its early days. Evaluation of the nutritional impact of managed migration from Java to Sumatra, the transmigrasi initiative, especially in the late 1970s and early 1980s, was a sobering exercise. The deliberations on food and nutrition policy in China in the 1980s were prescient of today's successes in hunger alleviation and food security and of the risks of diets favouring animal over plant foods.

The discovery of the **phyto-estrogenic properties of food** in post-menopausal women at Monash University transformed our understanding of food-health relationships (Wilcox G, Wahlqvist ML, Burger HG, Medley G. Oestrogenic effects of plant foods in postmenopausal women. *BMJ: British Medical Journal*. 1990 **301**: 905). It was then clear that the effects of food were dependent on phytonutrients as well as the accepted macro- and micro-nutrients, that this was physiological and that the intactness of foods mattered for health. This observation was to add to our later findings of food pattern integrals and survival in the IUNS-FHILL studies.

One of the most important and consistent themes in my work has been the health value of food variety and its dependency on biodiverse ecosystems (Wahlqvist ML, Specht RL. Food variety and biodiversity: Econutrition. *Asia Pacific Journal of Clinical Nutrition*. 1998 **7**:314-9). This is of course the first of any dietary guideline recommendations, other than breast-feeding. But it assumes importance as a measure of food security and an indicator of our ecological requirements. We are, in the final analysis socio-ecological creatures (Wahlqvist ML Ecosystem Dependence of Healthy Localities, Food and People *Ann Nutr Met* 2016) and our

disability adjusted longevity will depend on the extent of ecosystem loss which we have caused (Wahlqvist ML. Ecosystem Health Disorders-changing perspectives in clinical medicine and nutrition. *Asia Pacific Journal of Clinical Nutrition*. 2014 **23**:1-5.)

My presidency of IUNS sharpened my interest and focus on Africa, not only for its peoples' and food cultural richness, but also because it is where the nutritional needs and population pressures are greatest (Wahlqvist ML. Towards a new generation of international nutrition science and scientist: the importance of Africa and its capacity. *The Journal of Nutrition*. 2006 **136**:1048-9). Things have improved. The IUNS Congress was held for the first time in Africa in 2005 in Durban. IUNS adhering bodies in Africa have grown substantially and joined ranks through the Federation of African Nutrition Societies (FANUS). There is an African food and nutrition journal (AJFAND) edited by Professor Ruth Oniang'o (<https://www.ajfand.net/>). IUNS now has an African president in Dr Anna Larrey from Ghana.

To chair the **National Nutrition Committee of the Australian Academy of Science** from 2002-2005 was an honour and opportunity to link the various science-based food and nutrition organisations together in what was referred to as **FANO, the Federation of Australian Nutrition Organisations**.

This involved the Nutrition Society of Australia, the Australian Society of Parenteral and Enteral Nutrition, the Dietitians Association, the Australian Institute of Food Science and Technology, and the Nutrition section of the Public Health Association of Australia. It was supported by the board of the Australia and New Zealand Food Authority of which I was a member (1996-2002). For an extended period, I was active in **Food Regulation and Safety** with Directorship of an FAO Centre of Excellence in Food Safety at Monash University (1999-2006) and as Foundation Chair of the Food Safety Council of Victoria (1997-2003). Other rewarding activities have included membership of the WHO Expert Advisory Panel on Nutrition (1988-2010).

In active retirement, at the National Health Research Institutes in Taiwan, I have become involved in studies of food, metabolic disorder and the brain, particularly dementia, Parkinson's disease and affective disorders (depression). Disordered energy regulation with inflammatory consequences as in obesity and diabetes seems relevant. Protective approaches might include dietary biodiversity such that it includes culinary herbs. But much remains unanswered. It has been a privilege to have been involved in recent years in the development of a Chinese Nutrition Society leadership program and another in training at Zhejiang University in Hangzhou to identify and foster the careers of exceptional young people in China in food, nutrition and health science.

But my greatest passion now is to mitigate the climate change now underway. This threatens our food, water and energy security and to displace billions of us from our homes and communities (Wahlqvist ML, McKay J, Chang YC, Chiu YW. Rethinking the food security debate in Asia: some missing ecological and health dimensions and solutions. *Food Security*. 2012 **4**:657-70; Wahlqvist ML. Ecosystem Dependence of Healthy Localities, Food and People *Ann Nutr Met* 2016). Family planning to limit further growth in population size and the urgent abolition of fossil fuels in favour of renewable energy are food and health concerns. So too are the arrest of ecosystem loss, environmental contamination with microplastics, food waste prevention and nutritional ethics and equity. A new food and nutrition workforce, collaborative and crossing disciplinary boundaries, skilled in the optimisation of personal and community security, and in disaster nutrition management, is required. In the meantime, we can embrace the guiding principle that we should use and eat as little as we need and not as much as we can get. ■