

## Threads of life and health - a heritage of quality in practice

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The Ulster Medical Society is a unique organisation in which medics of all ages, backgrounds, and disciplines can meet, share experiences and learn together. This network of varied individuals can be considered to form a rich virtual tapestry of talent. The opportunities the Society offers for developing good links between individuals and disciplines helps to promote an aim of improving effectiveness in the work of healthcare provision and planning.

Recognition that there is value in learning from others is the base from which this address has evolved. It will reflect on a wealth of different life experiences and weave these loosely together to illustrate the quality of practice, both in medicine and in textiles, that is our Ulster heritage. Key points include the flax flower, various textiles, the cardiac defibrillator, renal dialysis and the Strangford stone, a granite legacy of high quality teamwork.

### THE 'THREAD' OF LIFE

According to Greek mythology, the metaphorical thread of life of every mortal from birth to death is controlled by three mythological figures, the 'Moirae' ("apportioners"). A 16<sup>th</sup> century tapestry depicts three ladies - the "spinner" who spun the thread, the "allotter" who measured the length allotted to each person and the "cutter" who chose the manner of death; and when the time was come, cut the life-thread with her shears. The concept of life resembling a thread which may be broken easily and outwith one's control remains within lay language today, such that when someone is critically ill it is said 'he's hanging on by a thread'. Within medicine the 'thready' pulse is defined as 'a small fine pulse that feels like a small cord or thread under the finger': its presence suggests life-threatening conditions and a need for decisive and urgent action.

### TAKING A MEDICAL HISTORY

To formulate a diagnosis and management plan in any clinical encounter medical students are taught that a medical history should be obtained by asking first about the presenting problem, reviewing specific body systems and then asking about past medical and family history. In preparation for this talk, I came across the mnemonic 'JAM THREADS' - an aide memoire to asking about specific conditions: *Jaundice*, *Anaemia*, *Myocardial infarction*, *Tuberculosis*, *Hypertension*, *Rheumatic fever*, *Epilepsy*, *Asthma*, *Diabetes* and *Stroke*. It may have been more useful to students in times past than today but for any doctor consulting with a new patient most of these conditions continue to have relevance.

In general practice we teach medical students about the 'threads' which we consider are always relevant to health -

physical, psychological and social issues. Exploring these allows diagnoses to be based on a biopsychosocial model of disease as opposed to the simpler biomedical model. Omitting to ask a 45 year old lady presenting with difficulty swallowing about her current social circumstances, which include imminent bankruptcy and marriage breakdown, and her father having died recently with oesophageal carcinoma, may not allow the physician or surgeon to make best decisions for her optimal management. In palliative care the importance of a fourth thread is recognised increasingly - that of a person's spiritual needs. Every good GP trainee knows that competence in clinical practice requires that each of these threads should be duly considered when making a diagnosis and constructing an appropriate management plan for any patient.

### FLAX AND FAMILIES

Flax, in Northern Ireland, has truly been a 'thread of life'. It was the means by which products were made that could be sold to obtain money to buy things which could not be grown or made on the farm and was the catalyst which held families and, indeed, communities together, ensuring care from 'cradle to grave' - before the days of the National Health Service.

The process of flax-growing began with finding the best seed, traditionally from the 'low countries' and Holland. Seeds sown in April, flowered in summer and plants were harvested in August. The flax plant grew with a single slender stem approx 1m high. In harvesting, stems were pulled from the ground, not cut, in order to preserve the full length of fibres. Small bundles were laid out in fields to dry and the seeds removed, for the next crop of flax or for cattle food. The plants were then 'retted' - traditionally soaked in stagnant water for about two weeks. The retting process depended on bacteria working between the fibres, loosening them. More recently developed chemical agents have allowed better control of this process. Retted plants were dried in fields again before scutching - beating them to further loosen individual fibres and remove debris. Scutching was a dusty job, done often by hand in confined spaces. Scutch mills, powered by an adjacent river, provided a mechanical process of beating which was faster, but dangerous - clothing or limbs could be caught by the blades and the mills often caught fire, ferociously, fed by abundant dry fibres.

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Flax seeds were usually sown by men, with women weeding the growing plants. Everyone, including children, was involved in the harvesting. Young children wound scutched fibres loosely into bundles, older children spun more refined fibres and women spun finished fine quality threads. Fathers and older boys worked looms and took products to the market. Extended families and local communities worked together, sharing resources. At times good seeds could be hard to find and especially so in Northern Ireland during the first World War. The inscription on a clock presented to my grandfather who lived near Markethill, Co Armagh, reads: 'To Jackson Pillow from his neighbouring farmers, in appreciation for his obtaining flax seed for them from Riva, Russia, 1916'. Involvement in the linen industry engendered a sense of loyalty and mutual support within families and communities.

### FACTORIES AND COMMUNITIES

If the flax was not fully processed at home, it was taken, after scutching, to factories for further combing ('hackling' and 'carding'). These were dusty processes but nothing was wasted. Woody stems were used for chipboard, short fibres were spun into a heavy yarn, for ropes and furnishings, longer coarser fibres were spun into threads for shoes, leather goods, canvas or carpeting. Fine quality threads were reserved for handkerchiefs, tablecloths and bedding. Bleaching the fine linen once relied on washing and laying on grass in sunshine but the development of chemicals made the process less dependent on weather, and more efficient. Textile workers with responsibility for preparing these chemical mixes required competence in numeracy. Just as medical students and doctors must calculate doses of drugs correctly, so factory staff were required to calculate correct quantities of chemicals for various processes - or hours of hard labour could be destroyed irreversibly with huge financial loss.

Factory work was not easy – the hours were long, often from 5.30am to 6pm weekdays and 3pm on Saturdays. Longer hours were required in summer and shorter in winter. Decisions regarding time were not those of the workers. Nevertheless, the work was appreciated, as expressed poetically:

*'I'll ne'er despise the weaving trade  
The shuttle's lighter than the spade  
By it I had a living made  
Monie a day'*

*John Dickey [1818]*

Linen thread production based in Lisburn and the braided and woven products of the factories established there by the Barbour family earned a world-wide reputation for NI's high quality of textiles (Fig 1). NI was recognised as a world-leader in this area of work, even exporting knowledge and skill to America. Belfast, at one time, was the city with the largest spinning mill, largest rope works and largest shipyard in the world.

As the linen industry flourished, it supported the development of communities. Perhaps the best well known of these is **Bessbrook** - founded by Richardson in 1845 as a 'model village', based on principles of "Three P's": no public houses, pawn shops or police, believing that with no public house, no pawn brokers or police stations would be needed. The houses constructed for the mill workers were of good quality; many

are still inhabited today. Each house had an allotment garden for growing vegetables. Sadly, in more recent years houses have been built on these, reducing such opportunities for today's local population. The village of **Milford** in County Armagh, was also established around the local linen mill. Rich and poor lived amicably in close proximity. Today the factory is idle but the neat terraces of red bricked houses, built by the mill owner, William McCrum, for the workers, remain comfortable homes.



Fig 1. Linen factories, Lisburn

The immense water-power of the River Mourne was the reason for choosing the site for **Sion Mills** in 1835. The mill and village built there provided better living standards for the community - by 1842 piped gas from the mill provided light for the village street and for every house. The owners, Herdmans, recognized people's social welfare and health needs: a canteen catered for bachelors and visitors (though not for most of the workers, who lived only a 2-3 minute walk from their work) and there was a resident doctor and nurse, paid for by workers' contributions. There was no public house (until a court case was lost in 1896) but there was a village band, with singing classes for the girls. For the first 30 years everyone attended Church together; work, housing and schooling was provided for all, without discrimination. Interestingly, the new state primary school in the 1970s was the first integrated state school in NI. This community found it hard to believe when the mill, the central pivot of village life for six or more generations, closed in 2004. Lower wages in other countries made the textile industry in NI uncompetitive. Local popular demand for cheap clothing did not recognize the paradox of also wanting higher wages for local workers and the wider implications for a community's well-being.

### TEXTILES AND LEISURE

The value of leisure time activity to people's health was recognized by the early linen communities. The sporting tradition of Sion Mills began in 1864, with a cricket team, which included both workers and gentry. Cricket is still an important feature of that community which readily recalls the celebrated moment in July 1969 when an Irish team defeated a West Indian touring team in the village.

In NI the textile industry may be considered to have led the way in promoting health by encouraging people's participation in sports. However, textile products themselves have relevance within many sports. Not only is team clothing important, but also the quality of materials used, for example, in sails, parachutes, skipping ropes and fishing lines. Fine precision



Figure 2a. Engineering care

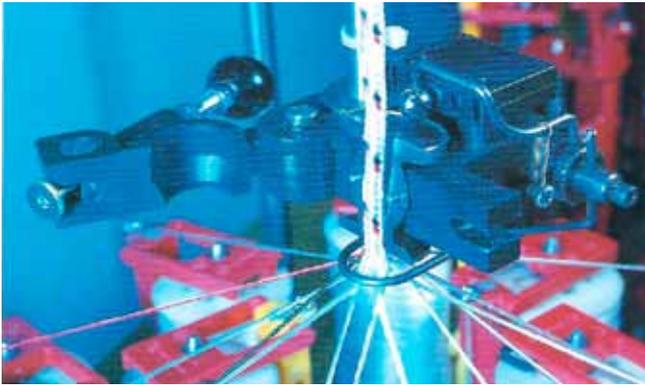


Figure 2b: Precision in design (Herzog braiding machine)

in weaving allows textiles to provide strength and resilience in all sorts of conditions. Textile manufacturers are often asked to adapt their products to meet different specifications. Ropes of high quality are essential for climbing but as Dr Nigel Hart and others in their recent 'Extreme' Mount Everest expedition illustrated, successful climbs depend also on retaining clothing and equipment. A dropped glove would not be retrieved easily at high altitudes and would certainly be a threat to well-being. Attaching items to people's bodies using lightweight, durable, flexible cordage, mostly made in NI, in Tandragee, was an important yet simple part of the successful expedition.

Linen has been used in covering aircraft wings, for years. Its durability and strength is demonstrated in a small aerobatic aeroplane, built in 1966, which has given countless hours of pleasure to various pilots in NI with the original fabric remaining intact and blemish free. The positive impact of flying on mental health is recounted by many pilots. Since this is National Poetry Day, one such poetic reflection may be given –

*“Sunward I've climbed and joined the tumbling mirth  
Of sun-split clouds - and done a hundred things  
You have not dreamed of - wheeled and soared and swung  
High in the sunlit silence.....”*

*John Gillespie Magee Jr.*

## MEDICAL TEXTILES

The earliest medical textile was linen: poultices, drawing

infection from wounds, used linen cloth for application. One such poultice, used in Belfast in 1942,<sup>1</sup> involved mixing boric acid with starch 'to a consistency of cream' and then adding boiling water 'to form a translucent jelly', to be spread on cloth, applied to the lesion and re-applied every four hours. Life today seems so much easier! Many preparations are available in tubs or tubes and some are already integrated with the cloth.

Attention to detail in engineering, keeping machines running smoothly, underpins the quality of textile products. Precision is required in each component thread of every product to create the desired design (Fig 2). Some local products that are used in medical practice and have been distributed worldwide include sutures, bandages, tapes and dressings. Research in biotextiles is creating new interactive fabrics with sensors, actuators and logic circuits. The applications will include wound management, tissue repair, rehabilitation, pressure garments, patches for drug delivery systems, and implantable devices. Scientists are developing new fibrous scaffolds that are biocompatible and support the growth of new tissues, encouraging cell attachment, proliferation and migration through pores. For example, research continues to examine how a polymer scaffold can be used to bridge bone defects and compare effects of different stem cells on bone growth. An effective scaffold must have structural and mechanical properties that are suitable for the type of tissue being grown. Using knowledge based in the textile industry scientists can customize structures for each cell type.

## BYSSINOSIS AND PEMBERTON

However, not all health outcomes linked to textiles are good. Byssinosis, caused by inhalation of textile dust may cause inflammation, airway constriction and respiratory difficulty. The symptoms commence a few hours after returning to work on a Monday morning, ease later in the day but become more severe and prolonged each week. Initially in the UK, byssinosis was defined as occurring in cotton workers and entitled workers to compensation. It was unclear if it also occurred in flax workers. Elwood<sup>2</sup> reports how John Pemberton was asked to address this question. His survey of mill workers in NI and in England found that, of over 2500 workers, 17% reported respiratory symptoms, 48% in the early stages of flax preparation but fewer in later, less dusty stages and none where dust was absent. This finding allowed flax workers to receive industrial compensation but Pemberton also noted that symptoms were rare in those who did not smoke cigarettes and worse in those who did. A 20-year follow-up study concluded that there was no excess permanent respiratory disability among former textile workers: lung damage was closely linked to cigarette smoking. This work was re-assuring for the industry, helping to stem a rising tide of compensation costs.

## PRINCIPLES AND PRACTICE

Pemberton was concerned about the impact of people's living conditions on their health. A fascinating overview of his life is given in a BMJ obituary earlier this year.<sup>3</sup> As a medical student in 1934, he published a paper which showed that unemployment benefits in England were insufficient to sustain healthy families. In October 1936, he applied theory to practice, taking an interest in the 200 men from Jarrow,

North-East England, who marched 300 miles to London with a petition highlighting their poverty following closure of their local shipyard. Pemberton and his fellow students set up a first aid station to feed them and tend their feet. His next major contribution to public health was a national survey, on which successful nutritional policy for the war years was based – that was considered the major reason for the UK's improved health after 1939 and worthy of advocacy today.

He was a leader in the international dissemination of research, including issues relevant to general practice. In his holidays he worked as a locum to Will Pickles of Wensleydale, an eminent GP and founder-president of the Royal College of General Practitioners. Pemberton came from Sheffield to Belfast in 1958 and linked with George Irwin who subsequently established the Department of General Practice in Queen's University, Belfast, (QUB) the fifth in the UK. Professor Irwin's vision and dedication has fuelled GPs' pioneering work in medical education. He always taught by example, even in late Friday afternoon surgeries, inspiring a desire to provide best quality care for all patients.

Following retirement in 1976 Pemberton continued to be active – in painting, hiking, postgraduate public health training and research. He died aged 97; his last academic letter was published a week before his death.<sup>4</sup> Before he retired his interests expanded to include coronary artery disease – and the establishment in Belfast of a World Health Organisation centre for the multinational monitoring of cardiovascular disease, subsequently led by Professor Alun Evans, and now by Professor Frank Kee.

### CORONARY CARE AND PANTRIDGE

Linked to Professor Pemberton through community studies of cardiac disease was Professor Frank Pantridge, also of worldwide renown. He has been claimed as the Father of Emergency Medicine in North America; his pragmatic example and impeccable recording of clinical data<sup>5</sup> led to them establishing pre-hospital care. Following his development of the portable cardiac defibrillator, he established Mobile Coronary Care (MCC) in Belfast in 1966, reported in the *Lancet*.<sup>6</sup> His careful research report comparing heart attack survival in two areas, with and without MCC, provided evidence of differences in cardiac outcomes.<sup>7</sup> He inspired the team he led and has been described as an extraordinary medical graduate, teacher and investigator. He is reputed to have worked on the principle: *"I never felt I had done my job properly unless the patient felt better for having seen me"*. His own life was far from uneventful<sup>8</sup> and perhaps because of this he had a desire to ensure that his patients received the best possible quality of care.

### RENAL DIALYSIS AND MCGEOWN

Professor Pantridge graduated from QUB with his MD in December 1946, as did my mother and Professor Mary (Mollie) McGeown, whose careful epidemiological research is the basis on which today's effective network of NI renal services was planned. She pioneered renal dialysis and transplantation in NI. From the first NI transplant in 1968, NI results topped the UK figures for survival. The team kept careful records and 'The Belfast recipe for renal transplantation' became known, used and respected worldwide.

Despite several absences due to childhood illness Professor McGeown's primary school (one room, two teachers and 35 pupils) gave her the foundation for admission to medicine at QUB but she was four days too young at her first application. With the outbreak of war, she returned to help her widowed mother on their farm, mucking out pigs, milking cows and 'loved it' - but her younger brother wanted to be the farmer. So she became a medical student, taking blood, performing minor operations and becoming adept at talking to patients which she regarded as a great skill. She undertook a MD with Distinction, in Pathology. Then, because she planned to get married, she was denied appointments to medical posts in favour of young men who returned from the War. So, she worked for a PhD in biochemistry, researching phosphate esters in milk but wished to return to clinical work. The Professor of Medicine offered her a post, if she could devise a research project and obtain a MRC fellowship – which she did, on the subject of kidney disease. Over time, she developed expertise in managing electrolyte problems and overcame many obstacles in setting up transplantation in Belfast.<sup>9</sup>

She had zeal, intelligence, and dedication. Her supporters were surgeons, nurses and technicians. Her search for perfection characterized her work, as did her committed clinical care, accurate data collection and scientific approach to management. She was one of Ulster's most distinguished physicians and clinical scientists,<sup>10</sup> but was also a caring loyal friend, efficient housewife and charming hostess, who took time to write 'thank you' letters after reciprocal visits with friends.

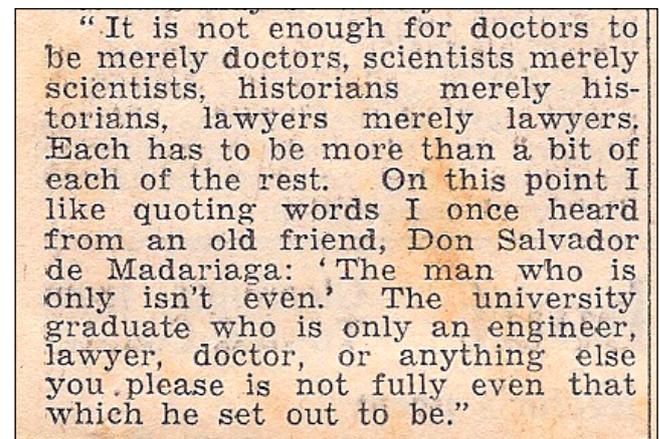


Fig 3. Sir David Keir, Belfast Newsletter, Friday, December 20th 1946

### PROFESSIONALISM

An excerpt from Sir David Keir's address as Vice Chancellor at the QUB medical graduation in December 1946 indicates what he expected from a professional graduate (Fig 3).<sup>11</sup> Their contribution to society should not be limited to their specialist area of knowledge. Pemberton, Pantridge and McGeown all exerted influences beyond their fields of medical expertise. Another excellent example of professionalism was that of Mr John Megaw, a skilful, scrupulous surgeon and clinical lecturer at QUB who supported Mollie whilst others discouraged her from bringing dialysis and transplantation

services to NI. He is also remembered for writing letters for wounded soldiers, transfusing, operating on and feeding them during the war. He was known as a quiet, wise man, an excellent golfer, gardener and host who practised his Christian faith.<sup>12</sup>

The breadth of service delivered by many rural general practitioners in NI in the same era was reflected in letters written to my mother on her retirement. Excerpts from one such letter include ‘thanks for all the medical care you have shown us over the years’....‘I recall the cold and frosty morning you came, took me into hospital, looked after me until my baby was born and then went to tell my husband the news’ [cars and telephones were scarce].....‘the night when she was so ill’.....; ‘and then there was the night we were so worried about.....’. Isolated incidents are woven into lifetime threads that make an impact which is hard to measure.

### THREADS OF TIME, ANGINA AND TEAMWORK

The first president of the Ulster Medical Society, John Creery Ferguson, was born in Tandragee in 1802. He entered Trinity in 1818, studied Arts, took first place and obtained a gold medal before studying medicine in Edinburgh. Later he worked in Paris, with Laennec, inventor of the stethoscope, and Kergaradec, pioneer of foetal auscultation. He returned to Dublin and, in 1850, became the first Professor of Medicine in Queen’s College in Belfast. The layout of the main street in Tandragee, where I now live, remains essentially unchanged over the past century but the horses and carts in earlier pictures have been replaced by cars, the road surface is no longer rough and lampposts and Chinese ‘takeaways’ have appeared.

Time, however, has not changed the importance of observation in determining the history of health or disease and the powers of remedies. Dr Samuel Black, born in 1764 in Co Down, studied medicine in Edinburgh, became a physician in Newry and was a careful observer. He described the sensation of angina, recorded pathological observation of ossified coronary arteries and developed the ischaemic hypothesis of angina pectoris.<sup>13</sup> He deduced that persons liable to angina were those of ‘full and plethoric habit’ and alluded to a genetic component - stating ‘those who indulged to a greater extent than was suitable to the tendency of their constitution’ were most susceptible. Others susceptible to angina were the psychologically stressed, whilst those who were exempt included females, those who took strong exercise and the French. Today we recognise the same risk factors for coronary heart disease, and research is still ongoing in NI to determine the best ways of encouraging people to be moderate in their diet and take more exercise.<sup>14</sup> Some of my younger colleagues set excellent examples of engagement in sports and have published research relating to physical activity and health.<sup>15,16,17</sup>

On 25th July 1934, near Newtownhamilton, a cross-border garden fete encouraged the community to participate in physical activity. The organisers included the local GP and my father, a young minister in two small local churches. The advertising posters invited ‘thousands’ to come and participate in running and cycling races; all ages were catered for with a variety of other attractions.



Figure 4. The Strangford Stone & Commemorative Stamp

A thousand young people from NI did come together one day in the year 2000 and pulled ropes, to erect the Strangford stone, a 10 metre high granite block, weighing 47 ton (Fig 4). The ropes were specially designed and manufactured, by my husband Tommy Reid in Tandragee, - soft enough outside not to hurt children’s hands, but with a core which was strong enough to withstand the immense weight without breaking. This achievement, a legacy of high quality teamwork, was recognised by a commemorative stamp (Fig 4) and in a poem by Michael Longley (Fig 5). The stone indicates how our past, present and future all are interwoven, to quote TS Eliot:

*‘Time present and time past  
Are both perhaps present in time future  
And time future contained in time past.’*

TS Eliot

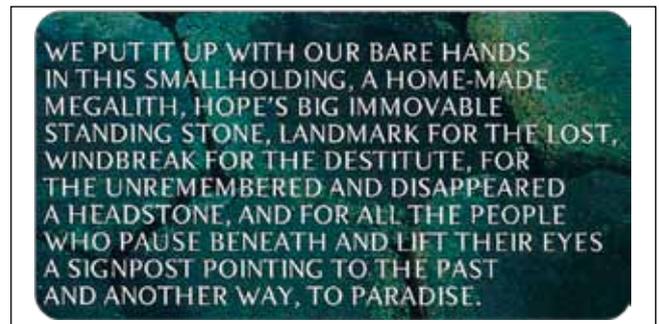


Fig 5. Strangford Stone (Stanza III) Michael Longley

### CONCLUSION

Linen is a cloth of the highest quality. As a reminder of its importance in NI, the flax flower was chosen as a logo for the NI Assembly. In Biblical times when Pharaoh honoured Joseph he ‘arrayed him in vestures of fine linen’ (Genesis Ch 41, v 42). When Joseph of Arimathea wished to honour Christ’s body, he wrapped it in ‘clean linen cloth’ (Matt Ch 27, v 59). I wish to thank all my family, friends and colleagues who have supported me in preparing this address, with special thanks to Alun Evans. I hope it has shown something of the high quality which the medical professionals mentioned have demonstrated within their lives. I hope that you will concur with my conclusion that the virtual tapestry woven

from thoughts of flax, families, communities, and medical practice shows that none of us lives in isolation from others and many threads are intertwined in everyone's life – and health. Recognition of this should help us to provide the best quality of healthcare for our patients.

The author has no conflict of interest.

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