

THE CHANGING OF A PARADIGM: THE CASE OF HEALTH CARE

By David Thomas

The word “paradigm” is being somewhat misused here, but perhaps its strictly technical meaning is not too important right now. For our purposes, we can understand “paradigm” as meaning simply the way the great mass of people in a any culture understand the world around them at any given time. Every society operates in terms of paradigms, even though a paradigm does not necessarily reflect the truth. Paradigms vary from society to society and from one time to another. We live at a time when paradigms relating to health care are slowly changing . Over the last roughly 100 years, the "Bio-Medical" paradigm has emerged, risen to a peak and nowadays, if not actually declining, is being metamorphised into a new paradigm containing much wider understandings of health. This movement is described in the lecture, but this article sets out how we came to be where we are and describes the forces that are making for a slow paradigm change.

LET’S GO BACK 100 YEARS TO 1898. It’s not such a long time ago. In that year, the author’s grandparents were young newlyweds. They were expecting their first child (my father) later in the year. I remember my grandfather well. He died in 1957 when I was 18. So 1898 is in a way, still within living memory.

My grandparents were typical fairly well-educated lower middle-class people. Were I able to enter a time capsule which would take me back to 1898 and talk to them, or indeed to most people like them about general health matters, their views might surprise us. For instance, if I asked my grandmother whether she intended to have her baby in a hospital, both she and my grandfather would have been shocked. My grandfather might have remarked: “We’re not rich, but we’re not so poor that we have to go to hospitals. You go to hospital to die, not to be born in.”

My grandmother would have been more than shocked; she might have actually felt insulted. Hospitals, she would say severely, was where “street girls” had their babies and only because there was nowhere else for them to go. In fact, many of them preferred to have their babies in the gutters, because in hospital they were likely to die of septicaemia. Poor things, my grandmother might say, she thought that sometimes they were forced to go to hospital simply because the doctors wanted dead bodies to cut up.

Well, where would this baby be born? At home of course. Would a doctor be present? My grandfather might react: "A doctor? We don't want any of them around here.". For one thing, having a doctor was simply unaffordable. My grandfather earned two pounds a week, and a doctor would charge ten shillings for a visit. (In today's terms, a person earning \$800 a week would have to pay a doctor \$200 for a house call.) Since my grandfather did not belong to a friendly society (they provided the earliest form of health insurance), he would have to pay this out of his own pocket. But I ask, wouldn't it be worth it to ensure the safe delivery of the baby? No, says my grandfather, he and his wife don't trust doctors. There was a good, experienced midwife who delivered all the babies

A CHINESE GRANDFATHER'S STORY

These observations were made in their journal by a student who did this course recently

At the time when my grandfather was young, he said he never saw a doctor because Western style medical treatment was too rare, his people found it unbelievable and it was too expensive for them to use. So if he were sick, at most my great grandmother would boil some herbal medicine for him to drink. When my grandfather got older, he still insisted he would not see a doctor when he was sick. At most you could only get him some cough medicine from a pharmacist ...

He was that kind of man who totally ignored the Biomedical approach. He only believed in Chinese medicine and mostly depended on natural healing. He even kept quiet when he got blood when he was coughing. When his sickness became more and more serious, he then allowed us to take him to a doctor. Sadly he was diagnosed with lung cancer, but he still insisted that he be not sent to hospital because he thought that only dying people would go to a hospital. He only let us take him to hospital in the last few days, partly because he knew it was about time to go and partly because he could not stand the pain anymore.

You may think my grandfather is quite stubborn, but I believe it is common for old people (maybe young people too) to think in that way. For the elderly, it was because when they were young, they did not have any idea about the Bio-medical model of health. Unlike us, we were all saturated by it, thinking that to see a doctor when we were sick is a normal routine. We were even prepared to go to hospital when we were not seriously ill. We have a lot of trust in the doctors who examine us. Most of us won't dare to challenge their authority. For us, it seems that they would never get anything wrong

But what if something goes wrong? I ask. If either mother or child dies, that's God's will, says my grandfather. But what do you do when you or a member of your family are sick? I persist, don't you need a doctor then? No, replies my grandfather: in his experience, besides being expensive, doctors killed as many people as they cured. It was much better to use the services and experience of

the local apothecary (or pharmacist) who not only knew about how to deal with all kinds of illness, but also made up remedies for them. Then there was Grandma Jones down the road who knew “the old ways” and what plants and poultices you used to treat various kinds of illness.

But what if neither of them could help - if the baby caught scarlet fever or whooping cough for instance? Once again my grandfather (who was a devoted churchman) replies: “If God wills, the child will survive, if not, the child will die. The Lord gives, the Lord takes away.”

As stated above, the views held by my grandparents would have been commonplace in 1898, although they would change radically over the next twenty years. That change was being spearheaded in the medical faculties at universities. So we now direct our time capsule to one such university, where we have an interview arranged with the one of the leading teachers there. We find him in his laboratory, where he can barely tear himself away from his new oil-immersion microscope. He asks what we want to talk to him about and we reply that we wish to have his views on the new bio-medical model of health. “I beg your pardon?” he says. “I’ve never heard of such a thing. Now if you’ll excuse me, I’m extremely busy. I’m on the brink of making an important new discovery.” A breakthrough? we ask “A what?” he says. “I’m sorry, I don’t know what you’re talking about, so I can’t be of any help to you. Good day.”

Let’s come back to the present and compare the differences in our thinking about health by asking some questions related to the imaginary interviews reported above. What would you reply be to the following?:

1. If you (and this includes the men in the class) had a baby due, would you prefer a hospital to a home delivery?
2. If you were severely (or even mildly) sick, would you hesitate to consult a doctor?
3. Would the cost of consulting a doctor prevent you from doing so?
4. If you were sick, would you consult anyone besides a doctor?
5. Would you be prepared to go to a hospital if you were severely or even mildly sick?
6. Do you associate hospitals predominantly with healing and cure rather than with death?
7. Do you believe that early death is God’s will, or can it and should it be prevented by medical intervention?
8. What’s your feeling about the bio-medical model of health?

You might, like the 1898 university professor, be asking: What IS the biomedical model of health? To which, the reply is: If you answered “Yes” to all or even most of the questions above, your thinking is saturated by it, even though you might not realise it. In contrast, both my grandparents when young, were genuinely ignorant of this approach to health care, which is founded on the assumption that both the cause and cure of disease is to be understood in purely biological terms. Such an approach downplays or ignores other

understandings of health which attach as much importance to psychological, sociological and economic factors as to the biological.

The professor on the other hand, while not yet being aware of the term “bio-medical”, was in fact among those who were fashioning this new model or PARADIGM which within a few years of our imaginary conversation with him, was to score a complete victory over the “old ways” represented by the apothecary, the midwife and Grandma Jones. We will look at the success of the bio-medical model in more detail in a moment. Here we might note that the speed with which it became the “dominant paradigm” of health in western societies, constitutes one of the most astonishing developments in health care over not only in the last hundred years, but in fact in all of recorded history.

The Scientific Revolution

The swift rise of the bio-medical model of health, particularly after 1900, did not occur in isolation. It should be seen as part of the much wider “scientific revolution” which had been transforming the more economically prosperous part of the world throughout the 19th century. This was an “age of miracles and wonders,” which had begun in the 17th century and really began affecting people's everyday lives with harnessing of steam power in the early years of the 19th century. Suddenly transport was transformed; trains began to carry people around at unheard of speeds - up to 120kmh. Ships no longer took six months from London to Sydney, but made the voyage in six weeks. Factories could go in for mass production, crops could be sown, reaped and threshed in what seemed incredibly short spaces of time.

Then came the communications revolution, with the invention of the telegraph. Messages could be transmitted across the world in a matter of seconds, compared to weeks and months. Radio, invented in the early years of the 20th century, was an even bigger advance. (Without it, the death toll in the *Titanic* disaster might have been even greater.) The telephone had been invented in 1889 by Graham Alexander Bell, who also invented electric light bulbs. By that time harnessing of electricity was well advanced. Houses and offices could now be lit, warmed (and in time cooled) by the flick of a switch, high rise buildings became possible as a result of the installation of electric lifts. Steam and electricity made the pumping of large quantities of water possible, which helped transform life in the cities healthier by bringing them clean water and getting rid of sewage. And in the 1890s, came the wonder of the “horseless carriage”, the motor car while in 1904 there was the greatest miracle of all - the first controlled flight by human beings.

PARALLEL PARADIGMS IN BANGLADESH

A student from Bangladesh writes about her country:

"In an underdeveloped country such as Bangladesh the power lies in the biomedical model or alternative medicine depending on the social and economic status of the people. The people in the rural areas where there is a high level of poverty and illiteracy do not trust the biomedical model at all. From my personal experience I have seen that even if they are seen by a doctor, they refuse to take the pills or treatment the doctor has prescribed and are not satisfied until they see a healer who is usually also a religious man. Their trust in the healer is complete as is the trust people in the cities of higher socio-economic status in the biomedical model. What seems to stand out is the conviction of the rural lower economic group people that doctors and hospitals are incapable of healing as everything is according to God's will [hence the use of religious healers]. There is an equally strong conviction among the well-off city community that the rural healer cannot do anything to improve the health of a person. This could be due to them not considering mental and spiritual well being as part being healthy."

These are merely the outstanding guideposts of the large mass of technological innovations which were transforming the lives of millions. What is important at this point is to realise that all were based on the application of *scientific methodology*. As a result, the triumph of science over older ways of understanding the world, particularly religion, which had begun 200 years earlier, was completed and consolidated in the late 19th and early 20th centuries. This was enormously aided and abetted by the rapid acceptance of Darwin's theory of evolution, which he propounded in his book *The Origin of the Species* published in 1859.

Science now became strongly associated with the idea of "progress", which in turn had sprung out of the Enlightenment in the 18th century. (Lupton, 1995,21) This led to a fundamental shift in thinking about the world, since the linkage between science and progress generated an enormous faith and trust in science not only among elite classes, but also among practically everyone in the Western societies. The old Roman saying: *Amor vincit omnia* - "love conquers all" - could now be rendered as *Scientia vincit omnia*, and indeed many enthusiastically adopted the idea of "man [sic] triumphing over nature", all of which evidenced the creation of a new paradigm in the Western world.

Science and Medicine

The application of scientific methodology to medicine and health care was a natural part of these developments, since both had been "scientifically" studied

for well over 3,000 years. However, even though knowledge about the functioning of the human body had made great progress (the circulation of the blood was discovered in the 17th century), understandings of the causes and cures of disease such as the "Black Death"(bubonic plague) which wiped out a third of Europe's population in the Middle Ages, were not much different in the early 19th century to what they had been in the 1st.

But in the later 19th century, things changed fairly rapidly. In 1862, a French scientist Louis Pasteur was able to demonstrate the existence of disease-causing microbes and this discovery was confirmed by a German researcher, Robert Koch, in 1870. This led Pasteur (he invented a process for sterilising milk still known as "pasteurisation") to formulate the "germ theory of disease". That theory represented a radical break from the "humoral" understandings of health and disease which had prevailed in the West since the time of Galen, an extremely influential doctor and writer who had lived in Rome 2,000 years earlier.

Ten years after Pasteur's discoveries, researchers had isolated the bacilli of what had been major killers in the past, such as typhoid, cholera, pneumonia, diphtheria, and meningitis.

Then in 1902. a British Army surgeon, nicknamed Major "Mosquito" Ross, discovered that malaria was caused by a parasite which he called *plasmodium*. Using the newly invented oil immersion microscope, which was much more powerful than previous instruments, he was able to examine the contents of the stomachs and salivary glands of *anopheles* mosquitos, which he found to be packed with *plasmodium* waiting to be injected into whoever the mosquito bit next. They were totally invisible to the naked eye so it was small wonder that the existence of these tiny killers had never been suspected before.

Around the same time other researchers (Ivanovsky in Russia, Beijerinck in the Netherlands) had isolated another disease-causing agent unknown to that time and to which they attached the ancient name of "virus" first used by a Roman doctor to denote poisonous fluids. Viruses are not living organisms like microbes and are therefore immune to antibiotics. They wreak enormous havoc in human populations by invading cells in order to replicate themselves. They cause not only relatively harmless conditions such as colds and 'flu, but also much more virulent diseases such as yellow fever, smallpox, poliomyelitis and most recently, SARS, bird 'flu and AIDS. Viruses are so small that they were never seen until 1939 following the invention of the electron microscope.

The discovery of these aetiological agents had two enormously important outcomes. The first related to the causation and the cure for disease. That it could be shown that there were biological agents or viruses or parasites which caused disease, knocked out older ideas that disease was the will of God or was caused by "miasmas" or bad odours or "bad air" (the literal translation of the word *mal-aria*.) They also finally buried Galen's "humoral" theories. Secondly, although initially knowledge about microbes (or germs) and viruses gave little

indication of how diseases could be treated and cured, at least it was now evident how disease could be prevented.

The knowledge that drinking water containing cholera, typhoid and other bacilli was deadly, and that it was likely to be so if raw sewage was dumped into rivers and streams, that fleas from rats were the vectors of bubonic plague, that mosquitoes were the vectors of malaria, meant that these diseases could be controlled at their source (although malaria still infects millions). Viruses could be controlled by injecting vaccines into the body in order to build up its resistance to viral diseases. In this way, smallpox one of the worst diseases to afflict humanity since time immemorial, was entirely eradicated in the recent past, while another terrifying disease, poliomyelitis, has been brought under control and now occurs only very rarely. The one viral disease which so far has defied all attempts to control it with a vaccine, is HIV/AIDS.

Prevention was one thing; however the cure of epidemic diseases remained a problem for another forty years until the great "breakthrough" of the discovery of antibiotics, which for some reason (still not understood) killed the germs which had killed millions of people over thousands of years. Through some amazing strokes of luck a British researcher, Alexander Fleming, discovered the first antibiotic, penicillin, in 1928. He was however, unable to produce it in significant quantities and it remained a mere scientific curiosity for several years until an Australian working at Oxford, Dr Howard Florey, led a team of researchers who in the late 1930s took up Fleming's discovery and realised the potential of penicillin. Thanks to World War II and the need for medications for American troops fighting in tropical areas, penicillin began to be mass produced for the first time.

After the Second World War, a much wider range of antibiotics began to become available. In the economically advanced areas of the world, there was a resultant sharp decline in the mortality from infectious disease. It should be said that the discovery of "miracle drugs" not only of penicillin and but also of cortisone, was due to luck as much as to research and experimentation. Despite drugs being produced in enormous quantities by companies which make correspondingly enormous profits, discoveries of new drugs had almost ceased by the end of the 20th century.

Advances in surgery

The other important outcome of the discovery of disease-causing bacterial agents was in the field of surgery. Five years after Pasteur announced his discoveries an English surgeon, Joseph Lister, demonstrated that these could be effectively applied in surgery by using techniques of "asepsis," which minimised the occurrence of bacilli in operating rooms. This was effected by keeping not only surgical instruments, but everything in contact with a patient undergoing surgery, clean and disinfected. That in turn led to enormously

improved survival rates for patients. Lister's work was rapidly followed around the world, the first "antiseptic operation" in Australia being performed in 1867

The effectiveness of these techniques meant that total cleanliness became the watchword not only operating theatres, but in hospitals as well. Before the discovery of microbes, it had not seemed particularly important. Doctors for instance, had not bothered to wash as they moved between operating theatres or the morgues in which they dissected cadavers and the hospital wards on which they treated patients. They often simply wiped blood and puss on the lapels of their white ward coats. Now everything had to be carefully disinfected by antiseptics like carbolic soap and filthy lapels ceased to be the mark of a hardworking doctor.

The discovery of anaesthetics

The application of the techniques of a-sepsis complemented another crucial development in surgery, the introduction of anaesthesia in the mid-19th century. Before that time patients simply had to endure pain and not surprisingly, a horrible feature of operations was the screaming of patients, who had to be tied or held down. On battlefields, the wounded undergoing "field surgery" would clamp their teeth on a lead bullet while having a limb amputated with a hacksaw (the bleeding being controlled by the application of boiling tar to the wound). That left such a lasting impression that even today we talk about "biting the bullet" whenever we face any unpleasant but unavoidable situation.

Although various methods for the control of pain such as hypnotism were tried, none met with much success. The problem of pain seemed so insurmountable that when solutions appeared, they were not taken up. One of these, the gas ether, had been known since the 13th century while another great pain killer, nitrous oxide ("laughing gas"), was not used anywhere outside amusement theatres and teenage parties (where it served the same purpose as does ecstasy today) for 75 years after it was invented in 1772. In the 1840s the realisation dawned among some dentists in the USA that "laughing gas" and ether could be used to anaesthetise patients who were having teeth extracted, and soon these practitioners were making good money out of "painless dentistry".

This gave one of their number, William Morton who lived near Boston, the idea that these anaesthetics could be used during surgical operations. Morton, who had been a crook and conman before taking up dentistry, was not afraid of risks. When he applied ether for the first time in an operation in October, 1846, not only had he never tested his equipment, he had never even seen it before. None the less, the operation was a success. The anaesthetised woman who was having a leg amputated, felt so little that when she woke up she asked when the operation was going to begin. She was then shown her amputated leg! After that, despite Morton's attempts to patent ether and make millions (honestly for once), the use of anaesthetics spread rapidly around the world because while Morton had been the first to use ether during surgery, he certainly had not invented it

and thus his patent could be ignored Ten months later anaesthesia was used for the first time in Australia by a Melbourne surgeon, David Thomas.

Although to this day no one understands how or why anaesthetics work, by mitigating the trauma caused by pain, they also greatly contributed to the survival rates of people undergoing surgery. Together with the application of the antiseptic procedures, these encouraged the use of much more adventurous surgery, such as appendectomies, the first of which was carried out in Australia in 1886. Before this time a “burst appendix” leading to peritonitis or perforation of the intestines, was practically 100% fatal. Meanwhile the discovery of X-rays (so-called because nobody knew what they were) by a German scientist, Roentgen, in the late 19th century, further enhanced the ability of doctors and surgeons to treat injury and disease.

These developments happened together with the reforms in nursing introduced by Florence Nightingale which vastly improved the standards of care and cleanliness and nutrition for patients. Her upper class origins, her enormous standing in the community and that she encouraged young, middle class women to replace the old, working class alcoholics as nurses, changed the reputation of hospitals. As a result, they were gradually transformed. The concept of “hospitalism” as a major cause of death disappeared and indeed, hospitals began to be thought of not as “factories of death” for the poor, but as places where decent, middle class and even upper class people (who before this time, would have been treated by doctors in their own homes) could go for treatment and come out, not dead, but actually cured.

The Paradigm Shift

Both behaviour and thinking in wider populations are rather like supertankers; it takes a long time to stop them or to change course. Even though concepts of and approaches to health were changing in the late 19th century, people like my grandparents would very likely have continued to hold the views on health and hospitals I have imagined above. Moreover, many doctors and surgeons, especially the older generation, did not accept or apply the new discoveries and thus their introduction into hospitals was a slow process.

However, when in the years immediately preceding the First World War newspapers began to write favourably about hospitals, this represented a crucial



HONORARY HELP.

THE ONLY PHYSICIAN WHO IS REGULAR IN HIS ATTENDANCE AT THE
MELBOURNE HOSPITAL.

*This cartoon, which appeared in the 'Melbourne Punch' on 6 September 1887 (p.355), illustrates the view of hospitals at the time as "factories of death". development, since it signalled a *paradigm shift*. At that stage, the thinking of people like my grandparents on health issues would also have undergone a radical change, because now they, and the great mass of populations in the Western world anyway, had become adherents of the new, scientifically-based paradigm about health, which in time was to be called the "bio-medical model", or simply the "medical model".*

As far as surgery was concerned, the 1960s saw the spectacular advent of transplant surgery (heart transplants) followed not long after by micro-surgery. In the field of childbirth, the triumph of hospital- over homebirths was virtually complete by the 1930s, while half-a-century later saw the introduction of *invitro* fertilisation.

One result of all these discoveries was that populations of Westernised countries became addicted to news about scientific “breakthroughs” (a term which was coined in the 1950s) and new, miracle cures. Fatalism, like that displayed by my grandfather, disappeared from peoples’ thinking, and even though no one denied that there were incurable diseases, there was widespread optimism and expectation that with the right kind of medical intervention, any disease could be overcome.

All these developments strongly re-inforced the new bio-medical paradigm, based on faith in the science and the scientific technologies which underlay the new discoveries. Pasteur's "germ theory", the foundation of that paradigm, and one of the best definitions is provided by Willis (1989): Germ theory, he writes in his book *Medical Dominance*, is based on:

... the tracing of the causes of disease to specific etiological agents (germs) which can be identified and treated or cured through either biological means (vaccines) or chemical means. Germ theory has come to provide the theoretical underpinning of what is referred to ‘scientific medicine’ (p12).

What this points to is that medicine was very much part of the scientific revolution, and here, as in so many other aspects of life, science seemed to promise a brave new world for humankind. Once again, science represented progress. and that the bio-medical model was totally identified with a scientific approach to medicine, accounts for its almost universal acceptance in the Western world, and its increasing ascendancy in other parts of the world.

Science under suspicion

But the total predominance of this model was a relatively short one. Both science and the bio-medical model fell under increasing suspicion from the 1960s onwards. Scientific discoveries had brought benefits, but also raised dangers like that of a nuclear holocaust. Another new paradigm, which was embodied in the environmental movement, began to arouse suspicions that science no longer represented pure progress, but had actually become a threat. For instance, one noted modern environmentalist, David Suzuki, writes in a book he co-authored recently:

Modern weapons from napalm to agent orange, Star Wars, Patriot missiles and weapons that target specific ethnic groups, were not dreamed up and created by military minds. It was *scientists* who conceived them. (p40)

Some of the scientific inventions like the DDT used to control malaria, proved in the longer term to be even more dangerous than the disease itself. Thus, while a fairly steady stream of scientific/medical breakthroughs continued to be made, one of the most notable trends in thinking about health in the late 20th century was the rise and acceptance of “alternative medicine”, which is not based on anything that falls within the conventional definition of “science” and in fact represents an alternative paradigm of health care. As we shall see later in this course, while "germ theory" was seen as being a truth about the causes of disease, there was an increasing belief that it was not the whole truth. Other factors, which involved the workings of the mind as well as of the body, came to be seen to be just as important as germs in the understanding of health and disease.

But here again, the “supertanker” syndrome is very evident. While there has been a decline in faith in the medical model and increasing criticism of the medical profession, none the less most people still think about going to the doctor when they believe they have something wrong with them, hospitals are still seen as one of the best indicators and safeguards of the health of the community. As we shall see, the great mass of health resources are still directed to the curative rather than the preventative dimensions of medicine. So while it has been challenged, the biomedical model of health still represents the dominant paradigm (or POWER) in thinking about health in the countries most of us in this class come from.

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