

Revisiting Flexner

Notes for remarks to the
Faculty of Health Science Faculty Board,
6 March, 2014

Mr. Dean, thank you for the invitation to come today. It's nearly 18 years since I last attended Faculty Board. It met monthly then and, as now, its meetings were not well attended. I worried about that, just as you are now. I worried because Faculty Board is officially responsible for academic policy in the Faculty of Health Sciences just as Senate is for the University as a whole. Collective agreements and such notwithstanding, the Faculty Boards and Senate constitute, under the Queen's Charter, the collegial structure of the Faculty and University. Maintaining their centrality in academic decision-making is, in my opinion, essential to sustain and strengthen (recapture may be the right word) the collegial culture that makes the university fundamentally different from other "workplaces". A university's governance structure and collegial culture lie at the root of academic freedom and responsibility which are, of course, fundamental to inventive education and creative research. At root it's what we're all about!

That said, I must confess to some incredulity when David Edgar contacted me about giving a talk intended to 'spice up' the agenda of the Faculty Board. I thought at the time that if remarks by Duncan Sinclair were to be the spice, agendas of the Faculty Board must be insipid indeed!

My topic deals with an already momentous and still fast-growing phenomenon with profound implications for health professional education and research. I refer to the so-called digital revolution – the near-universal, almost instant access that everybody in the world has to everybody else and to the total of recorded knowledge about nearly everything. John Stackhouse, publisher of the *Globe and Mail*, referred to it recently as the new industrial revolution¹. In my opinion, this challenge is more than equal to that addressed over a century ago by Abraham Flexner. At that time, 1910, health professional education was changed from its pre-20th century apprenticeship model to the current model whereby health professional education and research is based primarily on the need of practitioners for a relatively deep understanding of the science and other knowledge underlying, in our case here at Queen's, the practice of medicine, nursing, and of physio- and occupational therapy.

The Flexnerian transition to a university- and science-based model was made when two things became clear:

¹ Stackhouse, John. 2014. *Davos Diary: An new angst settles over the world's elites.* The *Globe and Mail* 25 January

- The apprenticeship model was producing practitioners of highly variable competency, extending in the lower end all the way to incompetence. Flexner led to common standards on the education of doctors, then the only health professionals thought to be affected. Nurses were considered to be appropriately trained by the apprenticeship model in hospitals and professionals in occupational and physiotherapy did not yet exist. Now, common accreditation standards prevail throughout North America and the threat of incompetently educated newly graduated health professionals of every kind does not exist. There may well be a threat to educational innovation from the imposition of too-rigid accreditation standards but that's a subject for another occasion.
- The primary factor behind the Flexnerian revolution was that the sciences basic to the health professions had advanced by the early 20th century to the point that practitioners had to understand their tenets in order to provide their patients with the steadily increasing efficacy and quality of care from which we benefit today. Those scientific foundations continue to grow. They are incorporated in the educational standards set by those who accredit our programs and who certify our graduates and trainees competent to practice medicine, nursing, physiotherapy, and occupational therapy. In fact, the scientific and related knowledge bases of all four of those professions (and others) are now so deep, so voluminous, and so predominant that many of us fear knowledge acquisition to be a serious threat to students' appreciation of the fact that, at root, all health professionals deal with real people and their families, made especially vulnerable by disease, injury, or disability. Correcting that imbalance is what Associated Medical Services' Phoenix Project is all about. But that too is a subject for another day.

As we roll along, already into the second decade of the 21st century, the so-called digital revolution constitutes a powerful new force at work. It is a force, in my view, just as compelling as those that led the Carnegie Foundation to hire Flexner to take his hard look at what educational institutions were doing as they entered the 20th.

The digital or new industrial revolution has many identities. In the health sciences you think of molecular medicine, personalized therapeutics, individualized care, intelligent drug design, and so on. But more generally, as I look around, virtually everybody I see is instantly connected to as much of the world, here, there, and far away, as they care to reach. Basically the digital revolution gives every individual on earth ready access to the universe of existing knowledge, including knowledge of threats to his or her health and well-being, as well as a growing ability to draw on a plethora of continuously recorded, app-derived personal physiological data. As these forces affect the health professions, I see coming a fundamental shift from population-based care, treatments, and research to those based on the fast-increasing knowledge of the genetic, lifestyle, and clinical characteristics of individuals, both of patients and particularly of people seeking to avoid becoming patients. Accompanying this shift to individualized healthcare, I see a growing insistence on a return to personalized care, care closely tailored to the needs, wants,

and cultural preferences of the individual patient and his or her family, a style of caring more comparable to that of yesteryear than of yesterday. Welcome AMS and the Phoenix project! I see coming high quality 21st century care delivered in a people-centered style like that described by Jackie Duffin in her great book, *Langstaff, A Nineteenth-Century Medical Life*².

One of the great things about being retired is that it provides me with infinitely more time than when I attended these and too many other meetings. I have time to read interesting things and to think about what I have read. In addition to re-reading Langstaff and Jackie's "Scandalously Short Introduction to the History of Medicine"³, among the things I have read recently are two books about the challenges presented by the fast-developing potential of individualized healthcare. They are well worth downloading or, better yet, buying from Oscar down at Novel Idea.

The first is by Eric Topol, *The Creative Destruction of Medicine*⁴. Dr. Topol, now at Scripps in California, is a cardiologist at the leading edge of the application of knowledge derived from genomic sequencing and from technology to record physiological functions digitally on your cell phone. He begins his book with a challenging 250 year-old quotation from Voltaire⁵:

"Doctors prescribe medicine of which they know little, to cure diseases of which they know less, in human beings of which they know nothing."

I think that a little harsh but his implication is that even after a century and more of remarkable progress in our understanding of the sciences underlying medicine, nursing, rehabilitation, and healthcare generally, the quotation still applies. Topol refers repeatedly to the long resistance of the health professions, of medicine especially, to the embrace of information management.

He points out the remarkable and still accelerating trend to connectivity made possible by invention of the cell phone in 1973, the personal computer in 1980, the internet in the '90s, and digital device proliferation, cloud computing, and social networking in the first decade of this century during which we have also discovered ever cheaper and more rapid sequencing of the genome. There both the speed and cost continue to drop at a rate that makes Moore's Law seem very conservative. It's easily possible today for any of us to send a cheek swab in to an internet site and get back a rudimentary sequence of our exome for a remarkably small price. In 2012, the first ever iPOP, an Integrative Personal "Omics" Profile, was done at Stanford. It includes many billions of data points, some 40,000 biomarkers from analyses of the team leader's DNA, RNA, cell proteins, antibodies, metabolites, and molecular

² Duffin, Jacalyn. 1993. *Langstaff. A Nineteenth-Century Medical Life*. University of Toronto Press, Toronto

³ Duffin, Jacalyn. 1999. *History of Medicine*. University of Toronto Press, Toronto

⁴ Topol, Eric. 2011. *The Creative Destruction of Medicine: How the Digital Revolution will Create Better Health Care*. Basic Books, New York

⁵ Francois-Marie Arouet Voltaire

signals. Complementing such data, the FDA has already approved a small host of biodetectors, so-called “sniffers”, home-use detectors for the protein in urine that reveals pregnancy, for glucose, cholesterol, and fertility proteins in blood, infectious microbes, nicotine, illegal drugs in urine, HIV antibodies in saliva – and a great many others are in the works as physiological data-recording “apps” for everybody’s smart phone.

And how on earth will we cope with such enormous volumes of data? Think of Watson, IBM’s plain-language computer that prevailed over two champions on Jeopardy a couple of years ago. According to a recent article in *The Economist*, “Watson is now smaller, more efficient and 24 times faster than it was when it won Jeopardy. It is being applied to industries such as finance and health both of which rely on expensive human advisors. Well-Point and the Cleveland Clinic are actively collaborating in the development of Watson apps related to healthcare. The computer is some way from making doctors and financial advisors redundant but it is well-placed to provided them (and everybody) with expert advice”.⁶

A number of “Cs” are fundamental to the ways we are changing:

- **Constant Connectivity** – nearly everybody is connected to everybody else. With Facebook, Twitter, blogs, databases, and the like we have a connectivity addiction; Topel calls it DADD, Digitally induced Attention Deficit Disorder”.
- Second are **Collaboration** and **Crowdsourcing**. Smart phones, the internet, and social networks have created a participatory culture. Facebook, I am told, reaches 98% of the world’s population, all of whom participate in the site in one way or another. Relevant to the health professions are participatory sites like PatientsLikeMe, WeAreUs, MedHelp, and others in which shared experiences are openly available to any and all who want to benefit from them. To quote Topol again, “our go-to source for health and medical information is moving away from our doctor – ... increasingly (to) crowd- and friendsourcing ...”
- The third pair of “Cs” is **Customized Consumption**. We are no longer content to buy the album; we download the particular song by the favourite band we want to hear.
- And finally, **Cloud Computing**, the cheap, seemingly unending capacity to store and instantly make available to everybody with an internet connection and a credit card the world’s total supply of data, information, recorded experience, advice, and opinion.

These “Cs” together more than fulfill the concept of “creative destruction” made popular by the business guru, Joseph Schumpeter. Such an apocalyptic phrase is little too “spicy” for me but I have to say am persuaded that while the health professional education business doesn’t need “destruction”, it does need, and quickly, to consider creatively how to change to do its job more effectively and efficiently in the new digital world in which we live.

⁶ *The Economist*. 2014, 11 January, A cure for the big blues, 54-5

For Christmas this year I was given another book entitled *The Cure in the Code*⁷, Subtitled “How 20th Century Law is Undermining 21st Century Medicine”. It is written by Peter Huber, a so-called polymath from New York’s Manhattan Institute for Policy Research. Huber deals with the mind-boggling potential of analyses of genomic sequences to unravel the causes of ill-health and to prevent and repair them. Huber’s fundamental thesis is that the legal foundation followed by Washington in its adherence to the randomized clinical trial as the gold standard to meet before new drugs are licensed, is blocking the intelligent design of new pharmaceutical agents based on our increasing structural knowledge of the genomes of disease-causing agents and the patients they affect. Basically, it is that RCTs represent population-based research, finding out what works with the least deleterious side effects for the average person. Contemporary knowledge of the genome makes it possible to discriminate between those people on the right-hand side of the distribution who respond well to a drug from those on the left who don’t. Contemporary knowledge makes it possible to tailor treatments to individual sub-populations and then down to individuals given the requisite information derived from analysis of their genome, their lifestyle, their clinical history, “sniffer” records, and that of the health-threatening agent involved, be it a bacterium, virus, prion, or whatever.

I must confess that whereas I found Topel’s book to be a great read, Huber’s, while provocative and informative, ran against the grain of my biases and irritated the hell out of me. The Manhattan Institute for Policy Research is one of America’s arch-conservative think tanks. It is heavily supported by the brand pharmaceutical industry, a perspective that is well reflected in Huber’s book as is that of the Tea Party, Rush Limbaugh, and others from the Republican far right. His second-last chapter is entitled *The End of Socialized Medicine*, which is what he seems to believe the United States has had now for many years, probably since FDR!

Neither book is good bedtime reading. Topol’s is too interesting and Huber’s, while also interesting, is too irritating in its pure-market orientation to be sleep-inducing.

What should we be doing to change health professional education to prepare students for effective work in this new world? Frankly I don’t know and I am unlikely to be useful in finding out. I am of the wrong generation. I still have to call on one of our grandchildren to re-program the VCR. I have a smart-phone but really only use it to read e-mails, send texts, and as an emergency ‘phone. But I do realize keenly that, as with information management generally, the health professions have to play “catch-up”. They are well behind the crest of the very big wave of the digital revolution. That wave is fast carrying forward to a shinier future those enterprises and fields that had the wit and discipline to get on their boards back in the days when the wave was smaller and easier to learn on.

⁷ Huber, Peter W. 2013. *The Cure in the Code. How 20th Century Law is undermining 21st Century Medicine*. Basic Books. New York

It's over time for the health professions to get into the water, pool their courage and resources. It's time to engage a modern Abraham Flexner to help them figure out what and how to change to meet the challenges of the digital revolution that is the hallmark of the 21st century. It's what this Faculty Board needs to do for contemporary health professional education and research here at Queen's.

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