The University: Past and Future
What's new?

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1 The Past

> "To carry the mind in writing back into the past, and bring it into sympathy with antiquity ... is a task of great labour and judgment – the rather because in ancient transactions the truth is difficult to ascertain, and in modern it is dangerous to tell."

These words of Sir Francis Bacon's are worth bearing in mind here today, for we often carry with us an image of the university's past that may be more ideal than real. History shows, I believe, that universities have always faced significant change imposed from outside. An important challenge has always been to properly balance nurturing the ideal against relating relevantly to society. The former requires stability, the latter adaptability.

Bacon's words come to us from about 400 years ago when his alma mater, Cambridge, was itself about 400 years old. Bacon was a harsh critic of universities and their 'schoolmen'. His time was one of much change and significant challenge to the university. It seems an appropriate place to start, although other times and other places would serve as well.

Long charged with the preservation, refinement, and promotion of existing knowledge, the universities became well suited to this role but research into the unknown was a different matter. Bacon argued that a new institution be created, separate from the universities, with the mandate to provide scholars the leisure and the facilities to advance the existing body of knowledge through novel research. So did others, including Sir Humphrey Gilbert.

Sir Henry Savile instead challenged the universities, Oxford in particular, to become the centres for new research. He arranged financial support, but it came with strings attached. As expected, Savile's professor in astronomy would teach Ptolemy, but he would be required to interpret Ptolemy in light of Copernicus.

Ties between society and the universities grew stronger. Generous benefactors built new colleges at Oxford and Cambridge which in turn provided lodging for the sons of their patrons. Colleges began to teach their own courses supplementary to those of the university and so became more responsive to students' and society's needs. The colleges became elevated in power within the universities and college heads were elected by aid of royal 'letters mandate'. Government's influence increased and solidified.

Student enrolment and demographics changed as more of the upper class expected university education for all their young men rather than only those destined for the clergy or other professions.

In the New World, new colleges were founded to educate the future leaders of the colonies. Here the tradition would begin not with guilds of learned masters who were pooling their resources for they didn't exist. Rather, from the beginning universities would be founded directly by local authority.

After the War of Independence, before even leaving New York, loyalists urged the founding of colleges in English Canada for fear that Canadian youth be "sent to the states of this continent where they will soon imbibe principles that are unfavourable to the British tradition."[1] Universities helped define the nation.

As society changed so too did the universities. With the industrial revolution, western society demanded greater access and different courses of study. Germany led the way in the early to mid-nineteenth century devoting considerable resources toward research aimed at national development and industrialization. Germany was also the first to establish graduate programmes and the doctoral degree which clearly marked research as integral to the university and of value to the nation.

Other countries soon followed suit and technical institutes were established throughout the western world. In the United States, direct links were encouraged between the university and industry, agriculture, and government service.

In 1869 Charles W. Eliot, the president of Harvard, argued that practical science and technology provided as sound a course of study for a university education as that of a classical college education. Eliot challenged the professoriate to develop new methods of teaching accordingly.

By the turn of the century, programmes in engineering, science and technology were well established. In North America student populations grew. U.S. figures show the average number of students at college roughly doubling every 20 years from 1870 to 1910. The ten largest American universities averaged 2,000 students apiece in 1895, doubled a short 15 years later, and increased to an average of 5,000 students in 1915.

In short, the challenges of the past sound familiar to the modern ear. Although the details differ, few of our modern concerns seem new in kind. The future would seem to be more of the same; the challenge is to think about what might be fundamentally different?

But first a brief interlude.

2 An Interlude

On July 6 1934, in the midst of the Great Depression, a convoy of 2 limousines, 5 Citroen half-tracks, 130 horses loaded with provisions and gasoline and 53 hollywood cowboys left Edmonton Alberta to begin a supposed scientific expedition across an uncharted region of the Canadian Rockies. Provisions included caseloads of champagne, exotic food such as caviar and truffles, clothing for society balls, a movie camera, and 100 pounds of surveying

[1] Letter of March 8, 1783 from Loyalists still in New York to the governor-in-chief of British North America Sir Guy Carleton. Page 28 of Harris, 1976.

equipment – this last item being the first dropped when the going got tough. The entourage included the leader's wife, a lady friend, a valet, a maid-in-waiting, a surveyor and a famous hollywood cameraman to record the trip for posterity.[2]

Now, it will come as no more surprise to you than it did to the Edmonton locals that when the entourage actually encountered the rocky mountains, forests, rivers and swamps of Canada's northwest bush, that one by one the vehicles were destroyed. And that supplying the huge party quickly became a nightmare. When the snow began to fly in October, the project was abandoned at a loss estimated to be over $250,000 – 1934 dollars!

What might come as a surprise is that this ill-conceived, poorly planned, badly executed, misguided trek was the brainchild of Charles Bedaux, a French born American millionaire who happened to be the western world's pre-eminent management guru.

During the Great Depression, as in other times when money is short, industry and government spent large sums of money on opportunistic management consultants like Bedaux who promise to recover more than their cost by increasing productivity! As economic conditions worsened, Bedaux's appeal increased.

Bedaux's consultancy was a flexible variant of Taylorism, so-called after the American Frederick Taylor who is still known today as 'the father of Scientific Management'. To maximize efficiency 'scientific method' would be applied to the shop floor. Performance measures were required. Goals could then be set and workers paid accordingly. Time and motion studies were the order of the day. Stop watch sales increased.

At the turn of the century, Taylorism was adopted and implemented by such managerial visionaries and pioneers as the Harvard Graduate School of Business, Vladimir Lenin, Leon Trotsky, and of course Albert Speer the economic organizer of the Third Reich. Of this lot, Bedaux seems to have been the most opportunistic.

From the outset, it was clear that this approach would require a new managerial professional class as overseers, planners, and efficiency experts. Taylor himself said: "As a general rule, the more men you have working efficiently in the management ... the greater will be your economy."[3] In the U.K. today management consultants are thriving. British management consultancy traces its roots with pride back to British Bedaux Limited. In 1996, the British Management Consulting Association boasted of having 7,267 consultants as members, three and a half times their numbers twenty years earlier.

And where might the future be for Taylorism? Well, in 1976 Peter Drucker[4] wrote:

> "The need today is ... to learn from [Taylor]. The need is to do for knowledge work and knowledge worker what Taylor, beginning almost a century ago, did for manual work and the manual worker."

... Yikes.

Now, 'knowledge work' and 'knowledge worker' sound an awful lot like the sort of thing that goes on at a university. And working with knowledge – acquiring, understanding, refining, teaching, or creating it – sounds a lot like the sort of thing one considers when one thinks about ... intelligence.

[2] The footage of the trip is preserved in Ungar's wonderful NFB film "The Champagne Safari".

[3] p. 422 of Copley (1923); also quoted in Saul (1997) p.119.

[4] Page 106 of Drucker (1981)

Objective measures of intelligence, and directing improvement of society as a consequence, are also ideas which trace their roots to the scientific optimism of the 19th century. They have, however, become classic cases where the built-in measuring bias has had tragic consequences.

In statistics we teach that every measuring system has three sources of potential bias and variation – the instrument or gauge, the method used to conduct the measurement, and the persons who actually do the measuring. Considerable effort has to be spent on each of these to reduce the bias and variation in the measuring system before even hoping to act on the basis of the measured results.

Experience with IQ suggests the validity of intelligence measures to be inherently problematic. If something is being measured, it is doubtful that it is what we would agree to call 'intelligence'.

Now, a university is a collection of individuals whose common interest is this so-called 'knowledge work.' Like the individual humans involved, the collection is essentially a living breathing organism. How much more difficult, then, to define valid measures of its merit? Moreover, since such measures are intended to steer behaviour, the organism measured will naturally respond. This kind of feedback adds another level of complexity to the measuring. A sure sign that the measuring system has a validity problem is that the organism can improve the measured value by taking actions which would not generally be considered to be improvements in merit.

But I'm sure others here will address this in more detail.

Now, back to the future.

3 The Future

The future is a matter of options. And to balance progress with preservation we must choose carefully between them.

Certainly gains of efficiency and productivity are there to be had, but these are more likely to come from the ground up, from within the institutions themselves, than from any collection of overseers with little understanding of the purpose and nature of universities. Their time horizons are taken from business and politics and are at odds with the longer horizons needed for the 'advancement of learning'.

Many of these efficiency gains will continue to be had through the judicious use of technology. But technology must integrate with and serve the functions of the institute – if it does not, it will not and should not be deployed. Universities were early adopters of e-mail, word processing, and the world-wide web because these technologies fit; they facilitated the normal working of the institute.

Further considerable gains in efficiency are being realized as more of the day to day administration of the university is being moved on-line – university policy and records keeping, student registration and course selection, career services, financial services, and university government. There is room for productivity gains in the administration of teaching and research as well. Communication of course information – handouts and course notes, postings of solutions and grades – can be done on the web. The announcement, scheduling, and organization of research seminars, workshops and conferences are ideally suited to the web. In all this, the productivity promise is to reduce the administrative overhead within the university community so that more time can be given over to its mission.

The web however is larger than this. Huge investments are now being made in cabling and switching infrastructure by government and business to provide high bandwidth information networks across nations and around the world. The net is now perceived to be of strategic economic importance by all levels of government. The world-wide web is stumbling towards adolescence and there is much wonder about its place in society. And in particular, about its relation to the university.

Three things together distinguish the internet from previous technology. First is its unprecedented physical reach. High-speed connections to the home and workplace are there now or will be shortly; lower speed wireless connections enable access from the most remote locations. A single-web-server can reach around the planet. Second, the net is open. Whatever information we choose to provide will be accessible world wide – no further special arrangements need to be made. Third, its currency is information. People access the net to find out something; school-children are trained to search the net as they would a library.

Here then is an unprecedented opportunity for the university to connect directly with the society that supports it. Not through any intermediate like government or business, but directly. An opportunity to offer information. An opportunity to define itself in the public eye.

A common suggestion, particularly from the overseers and network builders, is the development of completely web-based courses with 'facilitators' rather than instructors. Indeed a few so-called virtual universities have recently been established with the goal to provide all of their courses on the web.

This should give one pause for several reasons. Here are three. First the pedagogical soundness of such courses is suspect. As C.W. Eliot put it in his presidential inaugural address in 1869

> "...none know how crude are the prevailing methods of teaching these subjects as those who teach them best. They cannot be taught from books alone, but must be vivified and illustrated by teachers of active, comprehensive, and judicious mind."

If it is difficult to write a good textbook, how much harder to construct a good web-course?

This leads to the second point, namely the task is an undertaking of some magnitude. One estimate based on experience suggests 150 hours labour for each hour of quality web material, or about four years for a typical university course.

My third reason for pause is that the approach is founded on, and conveys to the public, the pre-Elizabethan model of a university as the caretaker of knowledge rather than as its developer. One suspects then that research must be done somewhere else, where the manuscripts are not quite so beautifully illuminated.

The population, our supporters, are most ignorant about the research role of the university. Though we often express frustration that this is the case, we take few steps to remedy the problem. Even amongst researchers, in a world which produces many thousands of periodicals annually, it is difficult to access existing relevant research. Integrative research, described in a recent Ontario government discussion paper as requiring

> "...that the researcher know about and understand advances in research in an area and can distil them for the greater understanding of students, other researchers, and the public"

generally falls outside the domain of established research journals, and is lost to all but a few colleagues and students.

To me, the best, most valuable place for a university's web effort is in the organized dissemination of its entire research effort. This would include: every research paper, every scholarly treatment of any subject, every public speech, and web-based pedagogical pearls which illustrate important concepts. The university's web space should be the first and permanent publication vehicle for its members. It should be completely open to the public.

Collectively, the university web spaces would constitute a virtual research library that could be indexed, searched, and accessed globally. The initial steps toward this goal can already be taken. If achieved, this would constitute a fundamental change and would be of lasting value. It would position universities well for the future.

Close

In summary then, the universities are older than parliament and during that long history have been undergoing continual change in concert with society. The challenge has always been to balance the long-term responsibilities that universities have to society against the short-term ones.

Universities will become more efficient in their internal administration largely through technological innovation and hardly at all because of scientific management.

Finally, the internet does represent a fundamentally new opportunity for universities to connect with society – both the general public and the world community of scholars. But a virtual university seems to be the wrong goal. Perhaps the great library of Alexandria predates universities for good reason. And its historical importance in western civilization remains unchallenged by any university yet created. Unlike the virtual university, a world-wide virtual library seems to be achievable and likely to better meet the needs of universities and society at large. Better that we direct resources towards an achievable vision of some import than towards one where the evidence indicates otherwise.

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