THE RESEARCH UNIVERSITY IN TODAY'S SOCIETY Gerald Chan

'University research is now the most powerful impulse for human progress'

[•]UCLPRESS

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In this topical lecture, investor and philanthropist Gerald Chan examines the role of philanthropy in the rapidly changing higher education environment. He proposes that society will be short-changed if the purpose of universities is seen as human resource rather than humanity. Dr Chan argues that the independence of universities is crucial for maintaining the balance between their dual role as engines of the economy and places of curiosity-driven research, and that a philanthropic publicprivate partnership is vital to that.

'Higher education is not cheap; but what is more expensive to society are the consequences of not supporting its universities... In a democratic society, governments come and go, and government funding priorities come and go, but a properly managed endowment endures.' Dr Chan's thought-provoking lecture ranges from pre-Enlightenment beliefs to the invention by Steve Jobs of the first Apple Macs, to demonstrate the vital role of universities to humanity. **Dr Gerald Chan** is a Boston-based investor who co-founded the international investment group Morningside. Dr Chan received his BS and MS degrees in Engineering from UCLA, a Master of Science degree in Medical Radiological Physics, and a Doctor of Science degree in Radiation Biology from Harvard University. He completed his post-doctoral training in pathology at the Harvard Medical School and the Dana-Farber Cancer Institute.

FOREWORD Professor Michael Arthur, President & Provost, UCL

'Higher education is not cheap; what is more expensive to society are the consequences of not supporting its universities.'

Dr Gerald Chan at UCL, 14 July 2016

r Gerald Chan is an unusual man. A serious scientist with four university degrees, a successful investor regularly featured on the Forbes richest lists, and a most generous philanthropist known for furnishing his own office via eBay.

Above all, he is a man who is passionate about what universities can achieve and understands that a better world will be underpinned by better, deeper knowledge. Crucially, he is proactive in applying his money to help make that better world take shape.

One of the great pleasures of my time at UCL has been the opportunity to get to know Gerald Chan and his wife Beryl – both modest, unassuming people who have enormous vision and are making a real impact on the world.

Gerald is a leading example of the new breed of global philanthropists, whose ambitions transcend borders and who want their funding to make the biggest difference, wherever that might be. We were proud and delighted that he agreed to be the keynote speaker at the VIP preview event for UCL's new Campaign, which will raise £600 million for life-changing research and education. We could not have asked for a clearer and more cogent overview of the unique, far-reaching value of philanthropy.

Philanthropy, he reminded us, is not a replacement or enlargement of core funding. It is doing something completely different. It enables great scientists to be daring and disruptive, to follow a hunch, to end in a place completely different to the one they expected, to pursue the projects that, for a variety of reasons, public funding cannot support. It is this work, as he shows so engagingly in this essay, that produces outcomes that shake society.

I am delighted that, with the help of UCL Press, we are able to share Gerald's superb speech with the wider audience it richly deserves.



THE RESEARCH UNIVERSITY IN TODAY'S SOCIETY Dr Gerald Chan

our years ago, we celebrated the sixtieth year of the Queen's reign. This year, we are celebrating her ninetieth birthday. Images in the media of the Queen in her younger days brought flashbacks of what Britain was like in the second half of the twentieth century. By any account, it was a period of astonishing change for Britain and for the whole world.

Comparing life then and now, the presumption is all too powerful that progress is the assured course of human history. However, if we reach farther in time, we will find that progress is in fact a rather young concept. Throughout most of the human past, men lived in the belief that the golden age was behind them.

Woodcut from Andreas Vesalius, *De humani corporis fabrica*, first published in 1543 and hailed as a breakthrough work in the new scientific approach to anatomy. This illustration shows the secondary muscles of the human figure. (UCL Special Collections SRC Folio 1555 V28) The lack of any palpable evidence of progress in their lives reinforced this belief which has as its corollary an eschatology that the final chapter of human history will be a climactic reinstatement of the former glory. People looked forward to what was in the past. Other cultures view the trajectory of human history as no more than a repetitive oscillation, one that begins with building up towards a golden age only to be followed by decline and finally cataclysmal conflagration. The cycle then begins anew.

It was the Enlightenment that freed the human mind to think that the human lot does not have to be a static one. The future can in fact be better than the past or the present. The concept of progress brought with it an optimism that not only will man's material conditions improve, so will his physical and psychological wellbeing, social organisation, culture, science and technology.

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K NOL ad rectangulum $KL \times KN$ ratio ultima, ubi cocunt puncta $K \otimes L$, eft æqualitatis. Ergo area illa Hyperbolica evanefcens eft ut AP. Componitur igitur area tota Hyperbolica ABOL ex particulis KNOL velocitati AP femper proportionalibus, & propterea fpatio velocitate ifta defcripto proportionalis eft. Dividatur jam area illa in partes æquales ABMI, IMNK,



KNOL, &c. & vires abfolutæ AC, IC, KC, LC, &c. erunt in progreffione Geometrica. Q. E. D. Et fimili argumento, in afcenfu corporis, fumendo, ad contrariam partem puncti A, æquales areas ABmi, imnk, knol, &c. conftabit quod vires abfolutæ AC, iC, kC, IC, &c. funt continue proportionales. Ideoq; fi fpatia omnia in afcenfu & defcenfu capiantur æqualia; omnes vires abfolutæ IC, kC, iC, AC, IC, KC, LC, &c. erunt continue proportionales.Q.E. D.

Corol.

Sections from Isaac Newton's *Principia Mathematica*, one of the greatest works, if not the greatest, of the Enlightenment. Published in 1687, it established a totally new conception of the universe, unchallenged until Einstein. (UCL Special Collections SRE 810 N2 (1)

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SECT. IV.

De Corporum circulari Motu in Mediis resistentibus.

LEM. III.

Sit PQRr Spiralis que fecet radios omnes SP, SQ, SR, &c. in equalibus angulis. Agatur resta PT que tangat candem in punsto quovis P, fecetque radium SQ in T; & ad Spiralem erestis perpendiculis PO, QO concurrentibus in O, jungatur SO. Dico quod fi punsta P & Q accedant ad invicem & coeant, angulus PSO evadet restus, & ultima ratio restanguli TQ x PS ad PQ quad. erit ratio equalitatis.

Etenim de angulis rectis OPQ, OQR fubducantur anguli aquales SPQ, SQR, & manebunt anguli aquales OPS, OQS. Ergo circulus qui transit per

puncta O, S, P transibit etiam per punctum Q. Coeant puncta P & Q, & hic circulus in loco coitus P Q tanget Spiralem, adeoque perpendiculariter fecabit rectam O P. Fiet igitur O P diameter circuli hujus, & angulus O S P in fenicirculo rectus. Q. E. D.



Ad OP demittantur perpendicula Q D, SE, & linearum rationes ultimæ erunt hujufmodi: TQ ad PD ut TS vel PS ad PE, feu PO ad PS. Item PD ad PQ ut PQ ad PO. Et ex æquo perturbate TQ ad PQ ut PQ ad PS. Unde fit PQq. æqualis PQxPS. Q. E. D.

Nn 2 Prop. XV.



From Albrecht Dürer's *Treatise on Proportion*, Nuremberg, 1528, showing the human figure in numbers. Dürer was a true 'Renaissance man' mixing art and science, pushing the boundaries of knowledge in ways that surpassed his contemporaries and influenced many later artists of the human anatomy. (UCL Special Collections S R C Quarto 1613 D8)

The study of Nature gave rise to another seminal idea – the idea that knowledge is power.

Knowledge stands out as a striking case in point. For millennia, the body of human knowledge was largely thought to be bounded and therefore could be exhaustively curated and neatly classified into a universal taxonomy. The French Encyclopedists of the eighteenth century epitomised this belief which had its beginning in the building of the Ptolemaic library in ancient Alexandria in Egypt. Under this conception, it was not considered lunatic for clever and ambitious people to think that they could learn all the knowledge there was to learn at their time. Leonardo da Vinci fancied himself as such, as did Francis Bacon a century later.

People in the past thought of the body of human knowledge as bounded because indeed, there was not much to study other than theology and metaphysics. A monumental development in the Enlightenment was the opening up of Nature as a field of study. Because Nature does operate according to constant laws, these laws can be known to man through measurements, mathematical description, logical reasoning and empirical verification. What has come to be known as the scientific method gave both impetus and structure to human curiosity. Nature became the subject in which new knowledge could be had and the scientific method became the standard by which new knowledge could be considered as valid.

The study of Nature gave rise to another seminal idea – the idea that knowledge is power. In 1620, Francis Bacon wrote, 'Knowledge and human power are synonymous.' In 1663, the physicist Robert Boyle made this idea even more explicit, 'I should not have neer so high a value as I now cherish for Physiology, if I thought it could only teach a Man to discourse of Nature, but not to master Her; and served only, with pleasing Speculations, to entertain his Understanding without at all increasing his Power.'

Thus was born technology as an outgrowth from science.



Illustrations showing a man's forearm, indicating the veins and their valves, from William Harvey's *De motu cordis*, 1628, one of most important works in medical history, which set out for the first time how blood circulates in the human body. (UCL Special Collections SRC 1628 H1/1)



In 1808 the engineer Richard Trevithick demonstrated a steam locomotive called Catch-me-who-can on a site near the top of Gower Street, the future site of UCL. It was the first experimental passenger railway powered by steam. (Cartoon ascribed to Thomas Rowlandson, copy held in UCL College Archive: Photographs)

For science to become the source of technological innovations was a novel phenomenon compared to earlier times when people with clever intuition or craftsmanship devised inventions without knowing the scientific principles underlying what they had invented. A prime example is the invention of the steam engine.

Thomas Newcomen, an ironmonger from Devon, invented the steam engine in 1712 to lift water out of the mines. It wasn't until 1824, more than a hundred years later, that the principles of thermodynamics were published by Sadi Carnot.

For the everyday man, science is esoteric and can be baffling. Technological innovation became the means whereby the everyday man gets to enjoy the new discoveries of science. He need not understand Bernoulli's principle and the Navier-Stokes equations in fluid mechanics in order to enjoy air travel in a plane. He need not understand Faraday's



Law and Maxwell's equations to enjoy his electrical devices or use his cell phone. He need not understand Einstein's general and special theory of relativity in order to navigate with his GPS. It is by technology that science becomes palpable to the everyday man, and thus, progress becomes experiential to him.

It was when society perceived the benefit of new knowledge that knowledge creation was transformed from being done by isolated people working by themselves here and there to an institutionalised effort supported by the public. Therein is the beginning of the modern research university. Besides the mission of teaching, the university now has a new identity as the locus of knowledge creation.

Why is this important to universities? For most of the university's existence since the first universities were founded in the eleventh century, the subjects taught were Greek and Latin, theology and the classics. The mathematics taught was from the ancient Egyptians and Greeks. The medicine taught was from Galen, the second century Roman physician. Universities then were a bastion for the preservation of the past. The modern university emerged when it turned from looking backward to looking forward and it was the introduction of research that caused the university to make this momentous turn. Research, therefore, fundamentally changed the character of the university.

The research function of universities also makes them the engine of progress in today's society. In no other field is this more evident than in medicine and human health.

Vaccines and antibiotics have caused the infant mortality rate to plummet. We know a lot more today about how to live a healthy lifestyle and if we get sick, doctors have many more therapeutics and devices in their armamentarium to restore the patient to health. Compared to the early 1950s, life expectancy in this country has gone up by about fifteen years. It is safe to say that most of these benefits we have enjoyed came from university research. Being in the biotechnology business, I can assure you that without university research, the pipeline for new medicines would dry up. The same can be said of many other industries from transportation to communication, from manufacturing to robotics, from energy to new materials. There is no doubt that university research is now the most powerful impulse for human progress.

With innovations come jobs and strength of the economy. So tight is this linkage that there is now a new geography of jobs that is distinct from the former geography shaped by manufacturing and finance. Cities with strong research universities will be strong economic centres of the future. The economist Enrico Moretti calls them the brain hubs. Even jobs for carpenters and taxi drivers grow at five times the rate in the brain hubs than in other cities in America. If the research function of the university produced innovations, it is the A diagram by Sir Ambrose Fleming illustrating the detailed process involved in sending the first signals across the Atlantic, dated 12 December 1901. (UCL Special Collections, MS ADD 122/49)

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An extract from Victor Horsley's operational field notes, featuring a cross-section of the brain. The notes were dated 13 July 1915, when Horsley served in Gallipoli (UCL Special Collections, Horsley Papers B29)

Besides the mission of teaching, the university now has a new identity as the locus of knowledge creation.

educational function of the university that produces the human talent that will sustain innovation as well as translate innovations into tangible benefits for society. Talent and innovation work in a virtuous cycle to make the brain hubs all the more entrenched as centres of economic strength.

Having lived in the Boston area in Massachusetts for over forty years, I am acutely aware of how the universities in our area have become powerful economic engines. We are living in a booming economy because of start-ups and because of large companies moving in to access the human talent. A few months ago, General Electric announced it will move its worldwide headquarters from suburban Connecticut to Boston. When IBM started its digital health business, the division was sited in Cambridge, Massachusetts. The location of corporate headquarters used to be determined largely by where the top executives could have a cushy lifestyle and hence suburbia. Now the decisive factor is the availability of human talent. The big Silicon Valley tech companies like Google and Facebook are expanding feverishly in Cambridge, Massachusetts because they have run out of engineers they can hire in California. So fierce is the competition for talent in Silicon Valley that the anti-trust statutes, originally designed for anti-competitive pricing of goods, have been applied to thwarting the collusion among tech companies not to poach each other's employees. But even poaching is sometimes too slow. Large tech companies have resorted to acquiring small companies as a way of hiring a readymade team in one fell swoop, a phenomenon known now as acquihire.

For many industries, talent has displaced labour, raw material, or cost as the most critical factor of success. The output of universities has therefore never been a more important input to the economy. This vital connection has fundamentally reshaped the relationships between the university and society and in some countries, The research function of universities also makes them the engine of progress in today's society.

between the university and government. In the massive expansion of higher education in post-WWII America, government's support was guided by the overarching vision, propounded by Harvard's then President James Conant, that an educated populace is a strong underpinning for a free, democratic society. That vision has receded and in its place, governments now view universities almost entirely through the lens of the economy. Government supports higher education for the sake of the economy and government regulates the universities as a player in the economy. Higher education has become the new labour market and for the Englishspeaking countries, a significant export industry. The British government's white paper on higher education in May this year by Jo Johnson made this all too clear.

Lest you should suspect that I have libertarian tendencies, let me elaborate with a concrete case. Last year, the governor of the State of Wisconsin in America, himself

a university dropout, proposed to change the mission statement of the University of Wisconsin System to include this language, 'The mission of the system is to develop human resources to meet the state's work force needs.' The Governor's proposal also included deleting from the University's original mission statement the languages of 'to extend knowledge and its application', 'to serve and stimulate society', and 'basic to every purpose of the system is the search for truth'. Couched under his agenda of managing the state's budget is a hidden agenda to change the nature of the university. This is not just a budgetary struggle, it is a struggle for the very soul of the university. Of course, the politicians who purport to match the output of universities with the needed input of the economy do so with the best of intentions. I find in such government actions an eerie semblance to the central economic planning practiced in the early part of the twentieth century in an attempt to perfectly match

supply and demand in the economy. We would do well to remember the disastrous results of central economic planning which prompted the economist Friedrich Hayek to say that the road to serfdom is paved with good intentions.

The temptation is for universities to offer only courses that are deemed to be useful to the job market. Let me pose a question. What was the course that Steven Jobs took that he credited with changing the course of the development of personal computers? In his own words:

Because I had dropped out and didn't have to take the normal classes, I decided to take a calligraphy class to learn how to do this. I learned about serif and san serif typefaces, about varying the amount of space between different letter combinations, about what makes great typography great. It was beautiful, historical, artistically subtle in a way that science can't capture, and I found it fascinating.

None of this had even a hope of any practical application in my life. But ten years later, when we were designing the first Macintosh computer, it all came back to me. And we designed it all into the Mac. It was the first computer with beautiful typography. If I had never dropped in on that single course in college, the Mac would have never had multiple typefaces or proportionally spaced fonts. And since Windows just copied the Mac, it's likely that no personal computer would have them. If I had never dropped out, I would have never dropped in on this calligraphy class, and personal computers might not have the wonderful typography that they do. Of course it was impossible to connect the dots looking forward when I was in college. But it was very, very clear looking backwards ten years later. Again, you can't connect the dots looking forward; you can only connect them looking backwards.



Image: *Discovery of Oxygen*, 1775, late showing experimental equipment. Brown's observations on random motion were based on the motion of particles suspended in a liquid or a gas. Joseph Priestley, better known for his discovery of oxygen, was also the first to study connections at a molecular level, ie between electrons and nuclei. (UCL Special Collections: History of Science Sources PRI)

Whoever would have thought that a course in calligraphy changed the future of computers? If the Governor of the State of Wisconsin had his way, I don't think a course in calligraphy would be on offer. Steve Job's words about the impossibility of connecting the dots looking forward are a sober warning to those who fancy central planning of higher education.

The combinations of educational experiences that go into producing productive citizens of the future are complex, stochastic and highly idiosyncratic to each individual. Using Steve Jobs' metaphor, universities should provide their students with as many dots, and as varied kinds of dots as possible, even ones that do not seem to be immediately relevant to any job skills. We must allow for a certain degree of irrelevance and even chaos in our university offerings. Meaningful chemical reactions do ultimately occur from random Brownian motion of molecules. That, in fact, is how nature works.

In content, scope and pedagogy, a university cannot be just about tomorrow's work force. While universities do produce tomorrow's work force, they are not vocational schools. To its students, the university owes more than just job skills that enable them to graduate and be immediately gainfully employable. The university's mission has a far greater sweep. Society in fact will be shortchanged if we reframe the university's mission to be about human resources rather than about humanity, and that, in the broadest sense of the word. Relative to the job market, a subject's perceived relevance and therefore its popularity may ebb and flow. It is important

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By JOSEPH PRIESTLEY, LL.D.F.R.S. The SECOND EDITION Corrected. Fert animus Caulas tantarum expromere rerum; Immenfumque aperitur opus. LUCAN LOONDON: Printed for J. JOHNSON, No. 72, in St. Paul's Church-Yard. MDCCLXXV.

We must allow for a certain degree of irrelevance and even chaos in our university offerings.

that the university's offerings not be entirely subject to such swings. Squarely situated in its time, there is nevertheless another part of the university's character that transcends time.

A university is first and foremost a community of scholars teaching, learning, and pursuing scholarly inquiries that spring from human curiosity. Whether a subject of inquiry is perceived to have immediate utility or not, it is ultimately to society's benefit if curiosity-driven scholarly inquiries are indulged. There are too many examples of enormously useful innovations coming out of 'useless' science done by crackpot scientists at the public's expense. One example I particularly like is the green fluorescent protein which became a tool that revolutionised cell biology and for which the Nobel Prize in chemistry was given in 2008.

How was this protein discovered? It came from a scientist who was interested in the question of why a particular jellyfish is fluorescent. Now, how useless is that! I mentioned earlier GPS and the theory of relativity. Do you think Einstein had any idea that the theory of relativity would one day become so useful to billions of people on earth? I reckon not. It took the better part of a century before a practical use was found. Society's interest is not well-served if favourable funding decisions are granted only to projects whose utility can be readily demonstrated. Such funding criteria may make the politicians appear as being accountable to the tax payers but are in reality detrimental to the progress of science.

I would like to share with you a beautiful dialogue that took place in 1969 when the physicist Robert Wilson went before the United States Senate asking for \$250 million to build a particle accelerator for the Fermilab. He was questioned by Senator Pastore, Democrat from Rhode Island.



SENATOR PASTORE. Is there anything connected in the hopes of this accelerator that in any way involves the security of the country? DR WILSON. No, sir; I do not believe so. SENATOR PASTORE. Nothing at all? DR WILSON. Nothing at all. SENATOR PASTORE. It has no value in that respect?

DR WILSON. It only has to do with the respect with which we regard one another, the dignity of men, our love of culture. It has to do with those things. It has nothing to do with the military. I am sorry.

SENATOR PASTORE. Don't be sorry for it. DR WILSON. I am not, but I cannot in honesty say it has any such application.

SENATOR PASTORE. Is there anything here that projects us in a position of being competitive with the Russians, with regard to this race? DR WILSON. Only from a long-range point of view, of a developing technology. Otherwise, it has to do with: Are we good painters, good Women students at the Slade School of Fine Art, UCL, or 'Slade Ladies' as they were called. The Slade played a key role in introducing women to university life, at a time when their participation in higher education was still a novelty (they had first been admitted to UCL in 1878 on the same footing as men). (UCL College Archive: Photographs) Manuscript poem by Lord Byron, 19 April 1812, *The pleasures of memory.* Byron's signature is shown bottom right in Greek. The study of history, literature and the arts is a critical part of a liberal education. (UCL Special Collections, SRE 221 R6)

sculptors, great poets? I mean all the things that we really venerate and honour in our country and are patriotic about.

In that sense, this new knowledge has all to do with honour and country but it has nothing to do directly with defending our country except to help make it worth defending.

Even though Dr. Wilson's words were spoken in defense of a physics project, they cannot be more appropriate in explaining any number of aspects of the university's relationship to society. One vexing problem concerns the humanities. Even if society accepts that the study of esoteric subjects in physics may one day have a utilitarian payback, the study of obscure subjects of history may not be treated quite so kindly. The place of the humanities harks back to the part of the university's character that is timeless. No human institution as much as the university serves the purpose of conjoining the present society with the human past even as it also contemplates the human future beyond the next election cycle. My reference to the past here is not a countenance to a sentimental nostalgia. We examine the human past because it is the playing out of human nature. History is human nature made concrete. History is case studies of humanity. As long as a university purports to serve the good of mankind, it owes to its students insights into the past and must honour this debt if the students are to become wise builders of the future. Our students should be able to converse with the past as they confront the present and imagine the future. Montesquieu had these words, 'For the occasions which produce great changes are different but, since men have had the same passions at all times, the causes are always the same.' This is why we study history, literature and the arts. These subjects are called the humanities because in them, humanity has found expression and in them, we gain insight into what makes us human. I am clearly speaking here in defense of a liberal education which I consider to be cognate to the university.

absent or present still to thee Why friend, what magic spells belong! is all can tell, who share, time me In time they converse, and they song But when the dreaded how shall come By Findship over deemed too nigh And Memory "our her Druid's tome Shall week that aught of the can die How foudly with the then repay Thy homage offered at her shrine and blend, while ages will away Her name immortally with this Mosaiphi april 19th on

The College as it actually appeared at the time of its opening in 1828 and for nearly fifty years afterwards. (UCL College Art Collection)

A university is a collective enterprise, yet scholarly research is an intensely personal journey.

The tension between universities offering a liberal education versus professional training is a perennial one for which there will never be a resolution, nor is one desirable. Our society and our economy are best served by people who are both civilised by being liberally educated and empowered by being professionally trained. Plurality of purpose inevitably leads to contradictions in execution. The alternative is uniformity and monotony, coercion and conformity - hardly a palatable choice. Because of the broad sweep of the university's purpose, the university is made up of contradictions and it lives with contradictions. It is at once practical and impractical, pragmatic and romantic, perhaps even quixotic and utopian. It is a place of convergence at times and divergence at others. The university offers a perch of aloofness from society, it also offers an avenue for engagement with society. A university is a collective enterprise, yet scholarly research is an intensely personal journey. Like all large organisations,

a university is normative, but no other human organisation tolerates so much eccentricity. A university has to balance its books but cannot be all about efficiency; it has to have planning but must also leave room for randomness and unplanned morphogenesis. We teach students to solve real world problems respecting constraints, but we also encourage them to cast off all restraints and do the hitherto unthinkable. A unique creature in human society, the university must not become monolithic in purpose, in conviction, in its constituents, in the time horizon of its endeavours, in the fields of study and in the methods of inquiry.

In order to sustain the coexistence of contradictions, there are certain necessary conditions of which I will touch on two. First, a university must be a place of inclusiveness and tolerance. The faculty should be protected by academic freedom. The students should be exposed to, even confronted with diverse viewpoints, learn to engage and process them,



and come to reasoned opinions. The university is not to cocoon its students but be a free exchange for ideas. The university's mission is to open minds, not to close them.

Second, in order to preserve the richness that comes with diversity and contradictions, the university must have adequate resources. By this I do mean primarily financial resources. Surveying the history of higher education in Britain in the post-WWII period, a very thorny question is how can British universities maintain their independence when they are totally dependent on the government for their funding. History shows that the relationship between politicians and universities has always been a love-hate relationship. The politicians love the university as an engine for economic growth and as a brain trust for the establishment, but few politicians can warm up to the idea of the university being a sanctuary to establishment's most fierce critics, to its being a safe harbour for those who dare to speak the truth when truth is inconvenient,

or people who dare to speak their minds even when their views are several standard deviations away from the mean. For some politicians, antisnobbery and anti-intellectualism is a shortcut to a populist appeal. If government was the only source of funding for the university, then there must be times when the dog will bite the hand that feeds it.

Even in the best of times, funding for the universities has never been generous in Britain. One of the wonders in higher education is how the British universities can maintain their quality with so little resources. For Britain's leading universities which compete internationally for the best faculty and the best students, competition is more stiff than ever before. The American universities are ever raising the bar. My hunch is that the resources required for the leading British universities to maintain their competitiveness in their league is of such a scale that public sector funding alone can no longer suffice. The answer is not for British The qualities of won'thets and aprighting being them uniform to fingues , on and at last there is by duets according to them the perform of them que -total might to remord to them date some afredericity time that g coup of and fals.

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Page from The Bentham Papers. (UCL Special Collections MS 035_291)

A university is first and foremost a community of scholars teaching, learning, and pursuing scholarly inquiries that spring from human curiosity.

universities to secede from the public sector as in a privatization. The answer is to augment public sector financing with additional resources coming from the private sector. Some may call this the philanthropic sector, or the third sector. It is where private citizens act for the public good. What is required now is a public-private partnership.

Public-private partnership is the model by which most American universities operate and is a major factor in their impressive performance in recent years. In rankings by any number of criteria, the American universities dominate the top spots. Further dissection of the data shows that it is the private universities in America that have done particularly well. In higher education in America today, one sees the state universities struggling to keep their heads above the water financially while the leading private universities are ever enriching and excelling in their educational offerings. These universities receive no funding from the government other than competing for research grants, neither do they just rely on tuition fees to sustain their excellence. The high quality of their educational offerings is made possible by their endowment income.

Let me use Harvard University as an example of how the endowment is put to good use since its endowment is the largest of all universities in the world. The composition of a university's student body begins with the university selecting what students to admit. These admission decisions have a large impact on what kinds of people the university will send forth into society as its graduates. In as much as the university selects its incoming students, the students and alumni also play a large role in defining the university. Harvard's admission process is need-blind. All that matters is the quality of the applicant. In addition, any student admitted to Harvard whose family income is less than \$75,000 per annum gets a free ride. Even though the nominal fees of the University are \$61,000

per annum, the average all-in fees paid by each of the 60% of the undergraduates who receive some financial aid from the university are \$15,000. The gap of \$46,000 per student is made up by donations and endowment income. This works out to nearly \$200 million of financial aid given by the University to undergraduates each year. This allows Harvard to pick the most desirable applicants relative to its selection criteria and irrespective of the applicants' financial means. Selecting students based on their ability to pay is a sure formula for a university to go downhill. This is a clear and present danger for many British universities.

Several years ago, the vice chancellor of a prominent British university said emphatically that universities are not here to fix the problem of social mobility. I find her statement rather antithetical to what I am accustomed to in American universities. We make it our business to look beyond the social determinants of intelligence or academic performance for promising students who demonstrated their commitment to excellence by making the best use of what educational resources they had available to them. Rather than appealing to any moral imperative or requisite of social justice, let me invoke the teaching of Jeremy Bentham, the putative founder of UCL, to say that it is simply of greatest benefit to the most that the financial barriers to university education be lowered by the philanthropic actions of those who have the ability to contribute.

I shudder to think what a society would be like if there was no possibility for social mobility. I also submit that there is no greater enabler of social mobility than quality education, the access to which society must strive to give to all.

Higher education is not cheap; what is more expensive to society are the consequences of not supporting its universities. I am therefore delighted that UCL is now launching a capital campaign to build up its endowment. An endowment is a statement of society's commitment to support the university. Each donation is a re-affirmation by someone that the university is worthy of support. In a democratic society, governments come and go, and government funding priorities come and go, but a properly managed endowment endures. While the university is being tossed to and fro by changing governments and changing policies, the endowment serves as a ballast to give stability to the ship.

My being here this evening to show my support is not because I have any prior affiliation with UCL other than a delightful friendship with the Provost; my support for higher education transcends institutional boundaries. Among the innumerable causes worthy of philanthropic support, I reckon that supporting universities has the greatest leverage in the sense that the benefits will be most broadly dispersed and most lasting in time. Imagine how many people around the world will benefit if the research of Professor John Hardy leads to a biomarker for early diagnosis of mild cognitive impairment, ways to retard disease progression and to restore some cognitive capacity to those suffering from dementia. The multiplier effect is massive. My friend at Harvard always said to potential donors, 'You are not giving to Harvard. You are giving to all of humanity through Harvard.' The same can be said of UCL. I therefore invite you all to join in supporting this great university which has done, and will yet do so much good for mankind.



'This is not just a budgetary struggle, it is a struggle for the very soul of the university.'



In September 2016, UCL launched 'It's All Academic' – a major philanthropy and engagement campaign to raise £600 million. The campaign will support UCL's biggest long-term ambitions and raise funding for projects that will transform the lives of individuals and societies around the world, with a particular focus on four themes – health, students, London and disruptive thinking.

See more about the campaign and our projects at **www.ucl.ac.uk/campaign**

