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CREATING THE FUTURE: 'NEW DIRECTIONS' IN AMERICAN RESEARCH UNIVERSITIES

ABSTRACT. This paper assesses the causes and consequences of recent American efforts to configure the research university as an engine of economic and social change. Drawing upon interviews and strategic plans, the paper describes recent policies to encourage 'interdisciplinary creativity', in a context of increasing income from private gifts and endowments.

INTRODUCTION

It is widely acknowledged that American research universities are experiencing a period of profound change. Many see the universities becoming more attuned to market forces, re-engineering themselves to become more efficient, while investing more in areas that attract earnings-conscious students and private research support. As Engell and Dangerfield have put it, 'In the Age of Money, the royal road to success (for academic disciplines) is to offer at least one of the following: a promise of money ... a knowledge of money ... (or) a source of money'.[1] The market-consciousness of the 'new university' has been celebrated by Liberals,[2] and excoriated by neo-Veblenians,[3] but it has rarely been denied. Key works during the last decade include such titles as *Academic Capitalism, Creating Entrepreneurial Universities*, *The Enterprise University,*

[1] James Engell and Anthony Dangerfield, 'The Market-Model University: Humanities in the Age of Money', *Harvard Magazine,* 3 (May–June 1998), 52.

[2] See, e.g., Lewis M. Branscomb and James Keller, *Investing in Innovation: Creating a Research and Innovation Policy that Works* (Cambridge, MA: MIT Press, 1998).

[3] See, e.g., Stanley Aronowitz, *The Knowledge Factory: Dismantling the Corporate University and Creating True Higher Learning* (Boston: Beacon Press, 2000).

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Universities in the Marketplace, and, pointedly, *Shakespeare, Einstein, and the Bottom Line*.[4]

However, this emphasis on markets and marketing may be overstated. While acknowledging (and often embracing) intense competitive pressures to hire top faculty and to move up in the rankings, administrators rarely favour the term 'entrepreneurial' to describe their institutions. They rarely consider student demand a major influence on the allocation of staffing, and say they hope to retain quality both in disciplines that 'promise money' and in those that do not. Indeed, most show less concern with markets than with status. American universities – like universities everywhere – try to enrol good students, hire the best faculty, and improve their comparative position.

For this, there is a straightforward explanation. On the whole, the private research universities in the United States are in a strong financial position, and do not feel compelled to respond reflexively to consumer demand. On the contrary, they can choose to back programmes they like. To compete with private universities, the various State-aided (or 'public') universities must follow suit to the extent possible.

The leading research universities have never been as wealthy as they are today. As Table I indicates, if universities were included among the *Fortune* 500 companies in 2000, as measured by operating budget, six would have made the list. Even as State appropriations have levelled or dropped, revenues from tuition, research grants, licensing of technologies, endowment, and annual giving have all increased, often at an extraordinary rate. Universities are no longer as dependent upon tuition, which today accounts on average for less than 25 per cent of the typical operating budget.[5]

[4] The cited titles are, respectively, Sheila Slaughter and Larry L. Leslie, *Academic Capitalism: Politics, Policies, and the Entrepreneurial University* (Baltimore: Johns Hopkins University Press, 1997); Burton R. Clark, *Creating the Entrepeneurial University: Pathways to Transformation* (London: Oryx Press, 1998); Simon Marginson and Mark Considine, *The Enterprise University: Power, Governance, and Reinvention* (Cambridge: Cambridge University Press, 2000); Derek Bok, *Universities in the Marketplace: The Commercialization of Higher Education* (Princeton: Princeton University Press, 2003); and David L. Kirp, *Shakespeare, Einstein, and the Bottom Line: The Marketing of Higher Education* (Cambridge, MA: Harvard University Press, 2003).

[5] This conclusion is based on an analysis of sixteen public and fifteen private research universities, which provided full financial reports in the Federal government's Integrated Post-Secondary Education Data System (IPEDS) in 1995. This is the last year for which comparisons between public and private sector institutions are possible, owing to changes in accounting standards for private institutions implemented in 1996. The figure is true both when revenues from auxiliary enterprises are included and when they are excluded. A separate analysis of financial statements from twelve additional public and private universities confirms this figure.

TABLE I

Universities That Would Qualify for the '*Fortune* 500' List, 2000

	Annual	
	Rank	Budget ($B)
Harvard University	273	6.9
Stanford University	350	5.0.
Yale University	396	4.2
MIT	419	4.0
Duke University	459	3.6
University of Michigan	491	3.3

Sources: Steven Brint, Charles S. Levy, Mark Riddle, and Lori Turk-Bicakci, *The Institutional Data Archive on American Higher Education, 1971–2000* (Riverside, CA: University of California, Riverside, 2003); Editors of *Fortune Magazine*, 'The Fortune 500 Largest American Corporations', *Fortune Magazine*, 143 (8), F-1 + . Based on annual operating budgets.

As their sources of funds have diversified, universities have grown in autonomy and ambition. States and donors are rewarding universities that aspire not to be responsive, but to lead. The position taken by Duke University is characteristic:

> (Private research universities) are resource-intensive places, typically combining large endowments, strong philanthropic support, and external research funding with high tuition. These resources are powerfully (cumulative) in supporting the teaching and research missions of these institutions and their commitment to national and international leadership ... *Our overriding goal therefore is to be among the small number of institutions that define what is the best in American higher education*. Certainly Duke can learn from other institutions, but we must also set our own sights and help set the standards for others. This is what leadership means.[6]

Some universities have indicated a preference for pursuing leadership through established professional channels – that is, by improving their standing within the disciplines. Others have indicated a strong interest in following 'new directions', less attuned to disciplinary rankings than to making 'cutting edge' contributions to new technologies, forms of expression, and social relations. A few universities can do both simultaneously, but this requires resources beyond the reach of all but the top wealthiest. For universities below this level, the more significant choice is not between the Ivory Tower and the marketplace, but rather between building strength in the traditional disciplines and creating new foci of 'interdisciplinary creativity'.

[6] Duke University, *Building on Excellence: The University Plan* (Durham: Duke University, Office of the Provost, 2001), 9–10. (Emphasis in original.)

This essay considers the causes and consequences of these new directions. From sixty-nine planning documents and interviews with 144 leaders (provosts and vice presidents of research) of eighty-nine American universities,[7] we can better understand the situation facing research universities, and the strategic choices they are making. These considerations lead us to see how a changing research base has created greater autonomy for universities, and enhanced their role as engines of economic and social innovation.

Meanings of 'Excellence'

Scholarly estimates of the number of 'true' research universities in the USA range from 50 to 125. Of the 'top 50' research universities, half are private; of the rest, two-thirds are State-aided. The explicit objective of each is to achieve 'excellence'.[8] However, the meaning given this term depends on an institution's aspirations and strategies. Thus, Montana State University, a teaching university that has suffered years of budget cuts, aspires to become 'the institution of choice in the Northern Rockies',[9] while Texas A&M, already a member of the prestigious Association of American Universities, desires to be 'recognized as one of the 10 best universities in the nation' by the year 2020.[10] Duke University, considered as one of America's outstanding private universities, has sought 'to be among the small number of institutions that define what is the best in American higher education'.[11]

Research universities aspiring to 'excellence' in the traditional disciplinary sense have measured themselves against self-selected 'peer institutions', using such indicators as student test scores, graduate/undergraduate ratios, National Research Council rankings, *US News and World Report* rankings, publication counts and

[7] Because I promised confidentiality to interviewees I will use categorical identifiers for quotations from these sources. Strategic planning documents and financial statements are public, and I will identify institutions when quoting from them.

[8] See, e.g., Charles T. Clotfelter, *Buying the Best: Cost Escalation in Elite Higher Education* (Princeton: Princeton University Press, 1997); and Bill Readings, *The University in Ruins* (Cambridge, MA: Harvard University Press, 1994).

[9] Montana State University-Bozeman, Strategic Planning Committee, *Minutes,* 5 September 2002.

[10] Texas A&M University, *Vision 2020: Creating a Culture of Excellence* (College Station: Texas A&M University, 2002), 2.

[11] Duke University, *op. cit*. note 6, 10.

impact factors, and, at the highest level, election to national societies (such as the National Academy of Science). In my sample, Northwestern University, Texas A&M, the State University of New York at Buffalo, the University of Maryland, the University of California (Davis), and the University of California (Irvine) are among the institutions that benchmark themselves on the basis of student and faculty strength. The University of Maryland, which, according to its strategic plan, has 'a clear vision of its future as a nationally distinguished public research university', expects 'to perform and be funded at the level of the public research institutions that have historically been the very best'.[12]

These institutions use benchmarking to assess their performance and to identify areas for improvement. Improvements in graduate financial aid packages, faculty salaries and recruitment packages, and ties to Federal agencies are often seen as high priorities. The academic plan for Texas A&M contains a typical list of concerns and goals:

> Our student–faculty ratio is 25 per cent higher than the best public institutions. Even in our strong colleges, we have too few National Academy members. Doctoral programs, especially in the social sciences and humanities, need development or need improvement by objective comparison through the National Research Council. Our graduate student population, while large in absolute numbers, is too small at 18 percent of the total student population; the best institutions have graduate student populations of more than 30 percent. Total research expenditures place us in the top ten nationally. However, our Federally funded research expenditures, those attained through national competition, are only 63 percent of the best public universities.[13]

As against this traditional approach, we can see emerging an alternative strategy, based on encouraging 'interdisciplinary creativity'. Support of 'interdisciplinary creativity' is only one direction that university ambitions can take, but it is notable because of the sharp contrast it presents with the traditional vision of a research university based upon disciplinary specialization. Its advocates sometimes express explicit opposition to the structures and aims of the traditional university. Thus, Michael Crow, President of Arizona State University:

> (A)cademic culture on the whole encourages each department of physics to compare itself to ... Cal Tech or MIT, each department of economics to compare itself to Chicago and each department of theater to compare itself to Yale ... (But) knowledge knows no boundaries ... The traditional disciplinary organization of universities may not be the optimal way to organize knowledge, or to the organize the institution itself, or to teach students to solve ... social, economic, and

[12] University of Maryland, *Building on Excellence: The Next Steps* (College Park: University of Maryland, 2000), 3.

[13] Texas A&M University, *op. cit.* note 10.

technological challenges ... Accordingly, I encourage teaching and research that is interdisciplinary.[14]

More often, contrasts between 'new' and 'traditional' approaches remain implicit. In 1994, the University of Southern California (USC) began an effort to develop a more 'creative profile' by upgrading its curriculum; by encouraging 'innovative interdisciplinary research and education in selected areas' that reflect the special characteristics of Southern California and Los Angeles (notably, decentralized urbanism, cultural diversity, and the arts and entertainment industries); and by giving priority to 'internationalization', by funding research on the Pacific Rim, and Central and South America. The full significance of 'new directions' became evident in USC's fourth-year assessment of its strategic plan:

> We know that the leadership we seek cannot be achieved by copying the successes of others, but rather must be earned through creation of a unique academic profile ... (T)he most interesting and important problems facing society today are highly interdisciplinary. With our complementary research strengths we have the potential to be a leader in addressing selected interdisciplinary problems of importance to society.[15]

None of the institutions in my sample that emphasize 'interdisciplinary creativity' indicate a strong interest in benchmarking using traditional measures. Instead, they focus upon areas in which they believe they can make a major contribution. Their strategy is to assemble teams to work on problems at the intersection of established disciplines. In the sciences, priority areas are aligned with Federal priorities in such fields as information technology, biotechnology, materials science, and nano-technology. Significant investments are also being made in bio-informatics, bio-engineering, environmental technologies, optical technologies, and homeland security technologies.

Commitments to 'interdisciplinary creativity' are also being made in the arts and humanities. Thus, the University of Illinois has funded programmes on 'the arts in a technology-intensive world', 'democracy in a multiracial world', family resilience, and the changing environment of public policy development.[16] At USC, cross-campus initiatives include efforts in communications, the arts,

[14] Michael M. Crow, *The New American University: A New Gold Standard* (Phoenix: Arizona State University, 2002), 15, 20.

[15] University of Southern California, *Four-Year Report on the 1994 Strategic Plan* (Los Angeles: University of Southern California, 1998), 5, 7.

[16] University of Illinois, Office of the Chancellor, *Cross-Campus Initiatives* (Champaign-Urbana: University of Ilinois, 2003).

and urban studies, as well as in the life sciences.[17] Strategic initiatives at Duke include interdisciplinary humanities, the integration of arts and technology, and 'global change'.[18]

Reflecting their Land Grant origins, public universities adopting the 'interdisciplinary' strategy are particularly drawn to projects that serve the economic development of their respective States. Private universities, by contrast, are more likely to emphasize the intellectual excitement associated with new fields. Yet, both are committed to 'creating the future'. In my sample, Arizona State University, Carnegie Mellon University, Duke University, Rensselaer Polytechnic Institute (RPI), the University of Illinois, and the USC are among the clearest examples of universities whose strategic plans embrace the new directions. At RPI, for example, the strategic plan asserts:

> We will make dramatic investments that substantially increase our involvement in two new arenas vital for national well being and growth: information technology and biotechnology ... We will ... do research at interdisciplinary intersections, exploit our 'low walls', and build strategic alliances to magnify impact.[19]

Research universities that focus upon disciplinary strengths typically allocate one per cent or less of their operating budget to new initiatives; those following the strategy of 'interdisciplinary creativity' allocate as much as five per cent or more. Thus, Pennsylvania State University's commitment of $11 million for interdisciplinary initiatives (from an annual $2.4 billion budget),[20] while noteworthy in absolute terms, is not a major commitment when compared with Duke's intention to invest $150 million annually over five years (from an annual operating budget of $3.6 billion).[21] Such commitments typically build upon earlier experience. Duke was well known for self-consciously avant-garde cultural studies in the 1970s, and was one of the first research universities to show a campus-wide commitment to interdisciplinary activity, as indicated by its '*Crossing Boundaries*' plan in 1987.[22]

Sources of the 'New Directions'

The forces propelling universities to move in these 'new directions' are different, as between the sciences and the humanities. On the one hand, global economic competition, reflected in Federal and

[17] University of Southern California, *op. cit.* note 15.
[18] Duke University, *op. cit.* note 6.
[19] Rensselaer Polytechnic University, *The Rensselaer Plan* (Troy: RPI, 1996), 14.
[20] Personal communication, Eve Pell to Author, 1 July 2003.
[21] Duke University, *op. cit.* note 6.
[22] Duke University, *Crossing Boundaries* (Durham: Duke University, 1987).

State research policies, presses universities and their scientists to devise technologies having commercial potential. On the other hand, the democratization of the liberal arts – notably, as refracted through de-centreing cultural theories – has provided equivalent support for new forms of expression and social analysis. The role of university managers has been to sense the compatibility between developments in the sciences and the humanities, to support them materially (if selectively), and to draw them together under the same conceptual proof. Through these actions, they have united adventitious developments and heightened their organizational significance.

The applied sciences and economic competition

In the sciences, the 'new directions' have their origins in the efforts of business, government, and education leaders, beginning in the 1970s, to improve US economic competitiveness in the face of challenges from the Far East and Europe. This concern led to the passage of Federal legislation, beginning with the Bayh-Dole and Stevenson-Wydler Acts of 1980, which encouraged universities and Federal laboratories to license new technologies to private firms, and which allowed universities to retain equity interests in companies begun by staff and students.[23] These laws have made it

[23] The literature on the causes and consequences of this shift in national policy is extensive. For a sample of historical accounts and useful outcomes studies, see Henry Etzkowitz, 'Entrepreneurial Science in the Academy: A Case of the Transformation of Norms', *Social Problems,* 36 (1), (1989), 36–50; Henry Etzkowitz, Andrew Webster, and Peter Healey, *Capitalizing Knowledge: New Intersections of Industry and Academia* (Albany: State University of New York Press, 1998); James S. Fairweather, *Entrepreneurship and Higher Education* (Washington, DC: Association for the Study of Higher Education, 1988); Irwin Feller, 'Technology Transfer in Universities', in J.C. Smart (ed.), *Higher Education: A Handbook of Theory and Research* (New York: Agathon Press, 1997), 1–42; Roger L. Geiger, *Knowledge and Money: Research Universities and the Paradox of the Marketplace* (Stanford: Stanford University Press, 2004), ch. 5; Walter W. Powell and Jason Owen-Smith, 'Universities and the Market for Intellectual Property in the Life Sciences', *Journal of Policy Analysis and Management*, 17 (1998), 253–277; Sheila Slaughter, *Higher Learning and High Technology: Dynamics of Higher Education Policy Formation* (Albany: State University of New York Press, 1990); Sheila Slaughter and Gary Rhoades, 'The Emergence of a Competitiveness Research and Development Policy Coalition and the Commercialization of Academic Science and Technology', *Science, Technology, and Human Values,* 21 (3), (1996), 303–339; and Paul G. Waugaman and Roger J. Porter, 'Mechanisms of Interaction between Industry and the Academic Medical Centre', in Roger J. Porter and Thomas E. Malone (eds.), *Biomedical Research: Collaboration and Conflict of Interest* (Baltimore: Johns Hopkins University Press, 1992), 93–118.

possible for more than fifty universities to generate $2 million or more in licensing revenues by 2003, and for a handful to generate licensing revenues in excess of $100 million annually.[24]

Beginning in the mid-1980s, the changing funding preferences of Federal agencies also encouraged new forms of organization. Both the National Science Foundation (NSF) and the National Institutes of Health (NIH) used their augmented budgetary appropriations to create a network of interdisciplinary research centres working on new technologies. During the fiscal year 2002–2003, the NSF funded 275 research centres from a base budget of $365 million (with many additional millions going to the individual projects of scientists associated with the centres). These included eight-two Information Centers, thirty-four Centers of Environmental Research, thirty-three Materials Research and Engineering Centers, twenty-nine Chemistry Centers, twenty-nine Plant Genome Virtual Centers, twenty Engineering Research Centers, eleven Interdisciplinary Science and Technology Centers, eight Nano-scale Science and Engineering Centers, and five Physics Frontiers Centers.[25]

NIH funding for interdisciplinary research centres is significantly larger than that coming from the NSF.[26] Other Federal agencies have either built upon earlier interdisciplinary efforts, as in the case of the NASA space research centres; or else have followed the lead of NSF and NIH by creating new centres designed to incorporate universities into the 'national innovation system'.[27]

The signals sent by these Federal agencies have focused an otherwise highly decentralized system. One vice president for research told me, 'We try to allocate discretionary resources in thematic areas – nano-technology, info technology, biotech, environment – the same as everyone'. He was keenly interested in matching agency priorities with campus strengths: 'Our materials research area is supported by NSF and Department of Defense (DOD). It emphasizes spin electronics and is led by the Department

[24] Association of University Technology Managers (AUTM), *AUTM Survey 2003* (Washington, DC: AUTM, 2003).

[25] National Science Foundation, *Budget FY 2003* (Arlington: NSF, 2003).

[26] Direct comparisons are difficult to make between NSF and NIH. For FY 2003, the NIH research centres budget is approximately five times that of the NSF. However, some centre grants are for improving medical research at 'minority institutions' ($290 million in FY 2003), and some grants are to individual researchers associated with centres. NIH statistics do not allow for disaggregating core centre support.

[27] See, e.g., Richard R. Nelson (ed.), *National Innovation Systems: A Comparative Analysis* (New York: Oxford University Press, 1993).

of Physics with support from engineering. We've had some spillover into the homeland sensors' bandwagon.' Some university managers now describe academic departments as 'silos' or 'stovepipes', and criticize them for being too narrowly specialized to adapt to new research policy environments.

The innovative spirit has activated some of the American States, which have set up 'centres of excellence' (or 'centres of innovation') in targeted fields. Typically, professors at one or two campuses are chosen to lead these centres. The State then earmarks funds to support their research in the hope that discoveries can be licensed to entrepreneurs. Large investments in centres of excellence have been made in New York State (over $470 million committed through 'NY Star' and related programmes) and in California ($400 million committed to the four new California Institutes of Science and Innovation). Funds for a 'centre of excellence' at one New York campus led, according to its vice president for research, to 'a complete redistribution of effort in that direction' .... 'We weren't lobbying (for it) .... But now they are giving us a new building and funds. We are opportunists. That's been the story at this institution for the last two years.' Smaller 'centres of excellence' now exist in Florida, Mississippi, North Dakota, Ohio, South Carolina, Utah, Virginia, and Washington.[28]

The Georgia Research Alliance (GRA), directed by Atlanta business leaders and university presidents, is another influential model. The core of the GRA investment strategy is its 'Eminent Scholars' programme. Scientists are recruited to Georgia from many parts of the world to lead 'extraordinary programmes' of research and development 'with high potential economic development impact for the state.'[29] By early 2004, forty researchers had been recruited to Georgia, each in a biomedical or engineering field, and placed at one of the six participating universities. The Georgia legislature has thus far authorized $375 million in support of its Eminent Scholars. According to GRA, these funds have been leveraged to bring in $2 billion in new Federal funds. They have also generated 'dozens' of new technology companies; attracted established businesses to

[28] Roger L. Geiger and Creso Sá, 'Beyond Technology Transfer: New State Policies for Economic Development for U.S. Universities', Paper presented at the 16th annual conference of the Consortium for Higher Education Research, Porto, Portugal (September, 2003). For a revised version of this paper, see the present issue of *Minerva*, 43(1), 2005, 1–21.

[29] Georgia Research Alliance, *Eminent Scholars Programme* (Atlanta: GRA, 2004) (http://www.gra. org/eminentscholars.asp).

the State; and created 'thousands' of new 'high wage, high technology' jobs.[30] Smaller GRA-style programmes exist in Alabama, Florida, Kentucky, Louisiana, Ohio, Virginia, and West Virginia.[31]

The popularity of such programmes has prompted questions about the consequences of shifting educational and research priorities. Thus, Richard McCormick, President of the University of Washington, has observed that his university:

> ... is a place of national eminence in genomics, photonics, computer science, Alzheimer's research, and many other areas .... It is also a place where more students are being turned away, classes are getting larger, and teaching positions are going unfilled .... There's no shortage of student demand for the teaching and learning we provide; it's just that no one wants to pay for it. In research it is the other way: Demand for what we do is matched by a willingness to foot the bills. [32]

Notwithstanding such concerns, efforts to develop new technologies, backed by large State and private investments, have encouraged programmes of 'interdisciplinary creativity' throughout the American research university sector.

The liberal arts and demographic change

The arts, humanities, and social sciences are not as central to university policies to 'create the future' as are the natural sciences, but they are more significant than nominal indicators (such as external funding), might at first suggest. Where universities are committed to 'creating the future', these fields point the way towards new forms of cultural expression and social relations. In some institutions, this is a featured role; in others, it is little more than background.

The sources of the 'new directions' in the arts and humanities are more socio-cultural than economic. Organizationally, they have taken the form of 'communities of sentiment' and 'parties of change', rather than the joint investment projects characteristic of the sciences. Many of these changes can be dated from the social movements of the 1960s and 1970s, with their demands for greater public attention to issues of race, class, and gender. During the 1970s and 1980s, a wide range of new interpretive frameworks emerged in the humanities. However varied in other respects, these new schools of thought were united in their opposition to established hierarchies

[30] Georgia Research Alliance, *Economic Impact* (Atlanta: GRA, 2004) (http://www.gra.org/economicimpact.asp).

[31] Geiger and Sá, *op. cit.* note 28.

[32] Richard L. McCormick, *2002 Address to the University Community* (Seattle: University of Washington, 2002), 15.

and in their repudiation of 'dominant truth claims'. Drawing upon similar sentiments, 'parties of change' flourished in communications and the experimental arts, and in social science fields associated with race, gender, social problems, and globalization.

While the 'culture wars' (*ca*. 1980–1995) flared in the media without producing a decisive victory for any side, a winner was slowly emerging among a new generation of professors.[33] In the arts and humanities and in some of the social sciences – notably cultural anthropology – scholars influenced by the new perspectives challenged many beliefs, including those predicated upon the assumption that the traditional academic disciplines were central.[34]

It is unlikely that 'parties of change' in the humanities would have become as prominent on campus without the help of deeper socio-cultural forces. They advanced with the help of two particularly powerful influences: the popular culture industries, and the growing participation of women and minorities in higher education.

University life in an age of mass higher education has no longer a natural affinity for many of its goals previously set by a traditionally defined, cultivated minority. As Martin Trow has put it, '[I]n recent decades, students ... have been oriented chiefly toward gaining useful skills and knowledge rather than to membership in a cultural elite'.[35] The leisure interests of most students are directed towards youth culture and the supporting industries. Many

[33] For assessments of the 'culture wars', see Michael Berube and Cary Nelson (eds.), *Higher Education under File: Politics, Economics, and the Crisis of the Humanities* (New York and London: Routledge, 1995); David Bromwich, *Politics By Other Means: Higher Education and Group Thinking* (New Haven: Yale University Press, 1992); Darryl J. Gless and Barbara Herrnstein-Smith (eds.), *The Politics of Liberal Education* (Durham: Duke University Press, 1992); Gerald Graff, *Beyond the Culture Wars: How Teaching the Conflicts Can Revitalize American Education* (New York: W.W. Norton, 1992); and Alvin W. Kernan (ed.), *What's Happened to the Humanities?* (Princeton: Princeton University Press, 1997).

[34] Studies of curricular change in the humanities and social sciences can be found in David John Frank, Evan Schofer, and John Charles Torres, 'Rethinking History: Change in the University Curriculum, 1910–1990', *Sociology of Education,* 67 (1994), 231–242; Arthur Levine and Jeannette Cureton, 'The Quiet Revolution: Eleven Facts about Multiculturalism and the Curriculum', *Change,* 24 (1), (January/February 1992), 24–29; Carolyn J. Mooney, 'Study Finds Professors Are Still Teaching Classics, Sometimes in New Ways', *Chronicle of Higher Education,* 6 November 1991, A22; and Frances Oakley, 'Ignorant Armies and Nighttime Clashes: Changes in the Humanities Classroom, 1970–1995', in Kernan, *op. cit*. note 33, 63–83. As in the applied sciences, the new directions in the arts, humanities, and social sciences coexist with more conventional professional interests in virtually every institution.

[35] Martin Trow, 'From Mass Higher Education to Universal Access: The American Advantage', *Minerva,* 37 (1), (2000), 1.

academics aligned with the new theoretical perspectives have developed a strong interest in the popular culture industries and, especially, in the putatively 'subversive' styles of youth culture. New thinking in the arts and humanities has fed off developments in popular culture, and occasionally contributed to their development. Everything young, new, and stylistically daring has come into their orbit. These interests formed a bond between students and 'progressive' faculty members.

Demographic change has been another important factor. By the early 1970s, white males had become a numerical minority on American college and university campuses. Most observers at the time wrote about the advance of science and meritocracy, and did not foresee that underlying demographic trends, in the form of demands for access, would soon have a large influence on higher education. By the 1990s, these consequences were clear. In 1993, Neil J. Smelser noted that conflicts over 'legitimate culture' could not be expected to fade away: 'The political forces of the nation are such that the march of diversification in universities ... will become an established historical fact'.[36] In 2000, white males represented less than one-third of all American college and university students. Their proportions were only slightly higher among full-time students, among students at selective institutions, and among graduate student populations. A few institutions in California and the Southwest became 'majority minority' for the first time in the 1990s. Diversity, a term of contention in the 1970s and 1980s, was, by the end of the 1990s, a universally recognized characteristic of American academic life.

Upheavals in literature and history departments stimulated new thinking in many fields and contributed models of interdisciplinary inquiry. However, the humanities have not received the lion's share of new funding for projects of 'interdisciplinary creativity'. Several universities, including the Georgia Institute of Technology,[37] the University of California (Davis),[38] and the University of Virginia,[39] are making large-scale investments in the performing arts; but few campuses are making comparable investments in the social sciences, and even fewer in the humanities.

[36] Neil J. Smelser, 'The Politics of Ambivalence: Diversity in Research Universities', *Daedalus,* 122 (4), (1993), 53.

[37] Georgia Institute of Technology, *Defining the Technological Research University of the 21st Century: The Strategic Plan of Georgia Tech* (Atlanta: Georgia Institute of Technology, 2002).

[38] University of California–Davis, *The UC Davis Vision: The Campus Strategic Plan* (Davis: University of California–Davis, 2004).

[39] University of Virginia, *Virginia 2020: Agenda for the Third Century* (Charlottesville: University of Virginia, 2002).

In contrast to the humanities, the performing arts are today attracting more students and, significantly, alumni donors as well. The vice president of research at a major university in the Midwest responded to an interview question by saying, 'We do have cutting edge work in the arts and humanities. We do a lot of fund-raising related to the performing arts.' Another vice president for research noted, 'We are investing in the arts. The Shakespeare (in our city) summer theater has become an important event. We realize that we are a tourist destination.'

The arts have also gained status – and a place in the 'new directions' – because of their increasingly close connection with technology. Digital arts programmes have become the most popular new interdisciplinary area outside the natural sciences. Not surprisingly, many partisans see them as closely linked both to creativity and to democratic social relations. According to the leader of an arts and technology initiative at the University of Illinois: '(Lines are blurring) between traditional notions ... of aesthetic experience, leading to the emergence of an open, multiple-perspective 'no-brow' view that more readily and naturally accepts the potential of technology-enabled aesthetic experience.'[40]

Comparing Models of Research Universities

For the time being, the 'new directions' are taking shape more as rhetoric than as embedded institutional realities.[41] Departments continue to control hiring, and for this reason, departmental organization will continue. A complete transformation of university structure is

[40] Mike Ross, 'The Arts in a Technology-Intensive World', in University of Illinois, *Cross-Campus Initiatives* (Champaign-Urbana: University of Illinois, 2003) (http://www2.uiuc.edu/ initiatives/ wpartsintech.html), 2.

[41] Certain features of this rhetoric demand careful study. The connection characteristically drawn by advocates of the 'new university' between interdisciplinary work and 'creativity' is especially dubious. Outstanding scientists and scholars can transform fields within the context of very traditional forms of organization, while interdisciplinary scholarship alone is no guarantee of creativity. Interdisciplinary organization can undoubtedly be a stimulus to creative breakthroughs, but other conditions are also necessary. For a sophisticated treatment of the role of interdisciplinary arrangements in major bio-medical discoveries, see J. Rogers Hollingsworth and Ellen Jane Hollingsworth, 'Major Discoveries and Bio-Medical Research Organizations: Perspectives on Interdisciplinarity, Nurturing Leadership, and Integrated Structures and Cultures', in Peter Weingart and Nico Stehr (eds.), *Practicing Interdisciplinarity* (Toronto: University of Toronto Press, 2000), 215–244.

unlikely, except at a few unusual institutions.[42] However, the rhetoric has been accompanied by many examples of real change involving cross-campus initiatives, new curricula, interdisciplinary centres, research 'umbrella groups', and buildings designed for interdisciplinary collaboration. It does not seem premature, therefore, to follow through the logic of the 'new directions', to consider how universities that are more oriented to 'creating the future' may look.

This consideration leads to several observations. First, the 'new directions' are based upon the concentration of economic and political resources, and not upon the actions of individuals or groups defined by disciplinary fields. Second, the preferred organizational forms are the 'interdisciplinary centre' and the' interdisciplinary conference', rather than the traditional academic department and disciplinary association. Publication in learned journals could therefore lose significance, as against publication in more fashionable 'cutting edge' journals, conference proceedings, and proprietary research reports. Third, the principal idea animating these 'new directions' is the 'creation of the future,' and not the 'advancement of disciplinary knowledge.' This reorientation reinforces the view that sees universities as engines of economic and social innovation. Fourth, in the natural sciences, the 'new directions' encourage the transfer of technologies to the private sector and support the universities' interest in licensing fees and equity shares in for-profit companies. In the arts and humanities, the 'new directions' encourage new forms of cultural expression and gender and racial-ethnic diversity.

A model designed to 'create the future' can be especially influential because it has the capacity to unite apparently conflicting tendencies (See Table II). Thirty years ago, Daniel Bell saw the forces of technological rationalization and cultural expression running in opposing directions, creating what he called the 'cultural contradictions of capitalism'.[43] More recently, some have seen signs of compatibility, reflected in such concepts as 'post-modern capitalism' and 'the creative economy.'[44] In

[42] Andrew Abbott, *Chaos of Disciplines* (Chicago: University of Chicago Press, 2001), ch. 5.

[43] Daniel Bell, *The Cultural Contradictions of Capitalism* (New York: Basic Books, 1977).

[44] On 'post-modern capitalism', see, e.g., David Harvey, *The Condition of Post-Modernity: An Enquiry into the Origins of Cultural Change* (Cambridge, MA: Blackwell Publishers, 1990); and Fredric Jameson, *Postmodernism, or the Cultural Logic of Late Capitalism* (Durham: Duke University Press, 1991) On the 'creative economy', see, e.g., Richard Florida, *The Rise of the Creative Class: And How It Is Transforming Work, Leisure, Community and Everyday Life* (New York: Basic Books, 2002).

TABLE II

Characteristics of Established Research Universities and New University Models

	Established research universities	New university models
Agents	Individuals and small teams	Large multidisciplinary groups
Means	Agency and Foundation Grants, fellowships	Concentration of large-scale economic resources and/or political support networks
Orientation of agents	Disciplinary, sub-disciplinary	Interdisciplinary
Underlying dynamic	Cumulative progress in fields of formal knowledge	Constant innovation in economy and society
Criterion of success	Rank in national ratings	Contribution to economic and social progress
Legal frame	Tenure and promotion; faculty privileges	Technology transfer laws; diversity guidelines
Dominant ideology	Advancement of knowledge	Creating the future

university life, the idea of 'creating the future' provides a powerful rhetorical link between advocates of technological and socio-cultural change. For all their differences, the 'new directions' in the applied sciences and in the arts and humanities show important affinities in their capacity to mobilize resources in pursuit of collective ends, in their commitments to interdisciplinary activity, and in their orientation to the future.

The 'new directions' also support notable re-distributions of power within the university. Consider Christopher Jencks and David Riesman's description of the research university of the 1960s, in which academic professionalism was dominant:

> (Universities) turn out PhDs, who, despite conspicuous exceptions, mostly have quite similar ideas about what their discipline covers, how it should be taught, and how its frontiers should be advanced ... (These men and women) have established machinery for remaining like-minded. National and regional meetings for each academic discipline and sub-discipline are now annual affairs, national journals publish work in every specialized subject, and an informal national system of job placement and replacement has come into existence. The result is that large numbers of PhDs now regard themselves ... (as) responsible primarily to themselves and their colleagues rather than their employers, and committed to the advancement of knowledge rather than to any particular institution.[45]

[45] Christopher Jencks and David Riesman, *The Academic Revolution* (Garden City: Doubleday, 1968), 13–14.

In 1967, Jencks and Riesman believed that university presidents had largely ceded control to this new class of experts: 'The typical [university] president's greatest ambition for the future is ... to 'strengthen' his institution, and operationally this usually turns out to mean assembling scholars of even greater competence and reputation than are now present.'[46] Today, university managers, displaced (if we are to believe Jencks and Riesman) by the 'academic revolution', are returning to a position of overall control by fostering programmes of 'interdisciplinary creativity'. Managers may support the 'new directions' for many reasons, including the prospect of attracting funds and the conviction that major new discoveries are based on conversations across disciplines. But political interests are also involved. Strategies to emphasize interdisciplinary creativity shift a share of control from leaders in the disciplines to those who are experts in aggregating resources and planning large-scale projects.

Wealth and Autonomy

Over the last two decades, rising tuition fees and declining State education appropriations have received much critical attention. A consensus has emerged that rising fees in the private sector reflect a policy choice to combine high tuition with high levels of financial aid.[47] In the public sector, increased fees (now especially high for out-of-State students) are widely accepted as an inevitable response to the fact of diminishing State support. These conclusions have provided the context for accounts of 'market-driven universities'.

Changes in university finances can, however, be read in another way. Tuition is an important part of any university budget, but, in strict dollar terms, is not the most important part. At private universities, tuition represents, on average, 40 percent of the educational and research budget – and much less at some leading institutions. Moreover, a significant proportion of tuition (one-quarter to one-third, as a rule of thumb) has been used to subsidize students from less affluent families. By contrast (using current

[46] *Ibid.*, 17.

[47] Perhaps more fundamentally, high fees reflect a 'positional arms race' in higher education at a time when competition for top faculty and rising student expectations have become very expensive. Clotfelter, *op. cit*, note 8, ch. 1; Geiger, *op. cit*. note 23, ch. 2; National Commission on the Costs of Higher Education, *Straight Talk About College Costs and Prices* (Phoenix: Oryx Press, 1998).

accounting standards), grants and contracts, private gifts, and earnings on investments represent fully 55 per cent of educational and research budgets of private research universities. In public research universities, tuition represents, on average, less than one-quarter of the operating budget. Taken together, Federal grants, private gifts, and earnings from endowment contribute slightly more to operating budgets than does net tuition.[48]

These considerations lead us to the importance of new sources of revenue. Without new sources of revenue, universities cannot put their visions into practice. Operating budgets in both the private and public sectors now typically exceed $1 billion, and the resources provided by non-tuition sources of income are in the high hundreds of millions of dollars. Indeed, some research universities can be fairly described, in budgetary terms, as relatively small educational enterprises attached to enormous research institutes and medical centres. In 2003, Georgia Tech, a public university without a medical school, received $82 million in net tuition, but $333 million in grants and contracts.[49] Washington University of St. Louis received $205 million in net tuition, but $428 million in grants and contracts and $436 million in medical centre revenues.[50] Vanderbilt, a slightly smaller private university, received $192 million in net tuition in 2002, and an eye-catching $930 million from health care services.[51]

The larger its revenue, the more likely an institution will be to have substantial discretionary funds, which can be directed towards 'creating the future.'[52] Columbia University, for example, has an

[48] National Centre for Educational Statistics, *Digest of Education Statistics 2002* (Washington, DC: NCES, 2002), 207, 376–377.

[49] Georgia Institute of Technology, *Annual Report 2003: Intersections of Innovation* (Atlanta: Georgia Institute of Technology, 2003) (http://www.gatech.edu/president/annual-report/fin-revenues.html).

[50] Washington University of St. Louis, *Annual Report 2002–2003* (St. Louis: Washington University, 2003) (http://www.annualreport.wustl.edu/summary.html).

[51] Vanderbilt University, *2002 Financial Report: Consolidated Statements of Financial Position* (Nashville: Vanderbilt University, 2002) (http://www.vanderbilt/edu/divadm/finrprt2002/statements1.html).

[52] Universities have developed budgetary structures to separate accounts related to 'core' educational and research operations from those related to 'peripheral' service operations. Thus, for example, revenues from medical centres are typically reinvested in medical centres, rather than used for broader university purposes. Similarly, auxiliary enterprises (such as dormitories and bookstores) are usually break-even operations and do not generate net revenues that can be used for educational or research purposes. However, it is not uncommon for net revenues from continuing education programmes to be redistributed to core programmes, and some institutions redistribute net revenues from other service operations.

endowment of more than $4 billion, annual fund raising of over $300 million, annual sponsored research expenditures of $532 million, fifty-two portfolio companies, 169 research agreements with private firms, current annual licensing revenues of $133 million, and term bills of nearly $37,000 for each of 7000 undergraduate students (subsidized, to be sure, for many).[53] Large and growing revenue streams in all major categories have enabled a few universities – such as Columbia – to compete effectively in the disciplinary system, while simultaneously building capacity in emerging areas.

Much of this increased revenue has been re-distributed to student aid, academic salaries, support services, new dormitories and recreation centres, and other education-related activities. Some, however, has been retained to fund new initiatives. This has led to a marked increase in institutionally self-supported research, perhaps the best indicator of increased autonomy. Institutional funds are now the second largest source of research funds (after the Federal government), accounting for 20 per cent of the total ($6 billion of $30 billion). While the proportion of funds provided by other sources has remained stable since 1985 (or, in the case of the Federal government, has slightly declined), the proportion of university self-support has doubled since the 1970s, when research budgets were much lower than they are today.[54]

It is difficult to square the rise in institutionally self-supported research with many recent arguments about the 'corporate university' and the 'market-driven university.' (Corporate support for research has, in fact, been relatively stable for decades at about 8 per cent of the total.) Instead, it suggests that major research universities are now in a position to set a significant part of their own agendas, although it is equally clear that these agendas complement or match the priorities of their most important patrons.

The past decade has been an extraordinary period for fund raising, with virtually all of the largest public and private research universities successfully completing billion dollar-plus campaigns. George W. Bush's presidential campaign in 2000 raised $191 million, by far the largest war chest in American political history. However, this amount is less than one-tenth the amount generated by the average top-level university fund raising campaign. Fund raising involves alumni networks, years of relationship building,

[53] Columbia University, Office of the Controller, *Financial Report FY 2003*. (New York: Columbia University, 2003) (http://www.columbia.edu/cu/controller).

[54] National Science Board, *Science and Engineering Indicators, 2002* (Arlington: National Science Foundation, 2002), 5-9-5-14.

outside consultants, hundreds of volunteers, distinct and well-orchestrated phases, and, often, the spirit of old-fashioned athletic rivalry. Yale classes want to outdo each other in annual pledges, just as they want to outdo each other in other achievements. Cornell University wants to beat the University of Pennsylvania in fund raising, in much the same way that it wants to beat Penn in football.[55] The prospects of university efforts to 'create the future' depend on the continued success of these campaigns.

Contributions to campus-wide initiatives, the key projects promoting the 'new directions', typically form an important part of these campaigns. Thus, at the University of Virginia, the president and his staff have spotlighted four 'Virginia 2020 Priorities' as centrepieces of the current campaign. The campaign will raise well over a billion dollars, with approximately $450 million dedicated to four priority areas: science and technology, the fine and performing arts, outreach and public service, and international activities.[56]

As this example indicates, some State universities engage in fund-raising at a level comparable to private universities. Nevertheless, it is essential to maintain a clear distinction between public and private research universities. Gifts and earnings on endowment play a far more limited role in the public sector, where these revenue sources rarely account for more than 10 per cent of operating budgets. State appropriations make up the balance, even as they shrink as a share of the budget. Even the most prestigious public universities receive 20–30 per cent of their operating budgets from State appropriations, and the figure for most is closer to 40 per cent. Because legislators are keenly concerned about access and teaching, State appropriations limit managerial discretion.

In the public sector, tighter budgets (and less promising fund raising prospects) oblige universities planning new initiatives to piece together relatively small amounts from many sources. Iowa

[55] Frank Rhodes, the former president of Cornell, recalled: '(The) step ... toward our super-goal (of $1.5 billion) was made all the more potent in our case by regularly stating that it was just a thought, but that our valued friends at the University of Pennsylvania happened to have raised $1.43 billion. ''That is a challenge,'' we mused to our donors, ''almost worthy of our annual football contests.'' This heavy-handed subtlety carried the day. We lost the football battle in the fall of 1995, but we won the campaign war'. Frank H.T. Rhodes and Inge T. Reichenbach, 'Successful Fund Raising at a Large Private University: Cornell University', in Frank H.T. Rhodes (ed.), *Successful Fund Raising for Higher Education* (Phoenix: American Council on Education and Oryx Press, 1997), 21.

[56] University of Virginia, *op. cit.* note 39.

State University, for example, plans to generate funds from increased State appropriations for economic development; from enrollment growth; from a reallocation of 2 per cent of its general budget; from 10 per cent per year increases in sponsored research funding; from increased indirect cost recovery on Federal research grants; from increased private giving (above the recent level of $100 million per year); and from growth in licensing income above $1.5 million.[57] Some institutions, such as the University of Washington, are 'taxing' units or making internal reallocations to support initiatives. Others, such as West Virginia University, are directing surpluses from continuing education or auxiliary enterprises into the support of campus-wide initiatives.

The point of all this effort is to get out in front of emerging areas, and to leverage funding from Federal and State governments, corporations, foundations, and private donors. Ronald G. Ehrenberg, a former vice president of Cornell, tells a story that shows how this works:

> In the spring of 1995, Cornell's engineering dean informed the central administration that to be at the cutting edge in research relating to electronic and photonic devices, biotechnology, and advanced materials processing, the university required a major new research facility.[58]

A preliminary estimate put the project in the $40 million range. A gift of $20 million from David Duffield, founder of PeopleSoft, Inc., pushed the facility forward. 'Knowledge that Duffield Hall was in the works clearly was a major factor' in the award to the university of a five-year grant for $19 million by the NSF to establish a National Centre for Nanobiotechnology.[59] Large gifts like Duffield's have been used at many institutions to build infrastructure, recruit staff, and leverage funding from government, corporations, and foundations. The University of Illinois set the tone by creating the Beckman Institute for Advanced Science and Technology, with a large gift from the Beckman family in 1989. This Institute has since been awarded $30 million in Federal grants. The size of private gifts has been growing. A $100 million gift to Harvard and MIT by the Broad

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[57] Iowa State University of Science and Technology, *Becoming the Best Land Grant University: Strategic Planning for 2000–2005* (Ames: Iowa State University, 2000).

[58] Ronald G. Ehrenberg, *Tuition Rising: Why College Costs So Much* (Cambridge, MA: Harvard University Press, 2000), 104.

[59] *Ibid*., 109.

family to apply genomic research to medicine is just one recent example.

Ronald Ehrenberg states that Cornell will contribute $7.3 million in additional funds to its nanobiotechnology centre, so as 'to purchase new equipment, to provide start-up funds, to pay for graduate students' tuition, fees, and fellowships, and to defray administrative expenses'.[60] Some of this new money would have been spent for these purposes anyway, but some are required as a condition for awards of large Federal grants. Cornell's experience is typical. Leveraging does not reduce costs, but it does increase resources.[61]

Uneven Development

New organizational forms are required to encourage 'interdisciplinary creativity'. I asked campus leaders about the mechanisms they were using to encourage the 'new directions', and their answers were revealing. More than three-quarters of respondents – from both public and private research universities – reported efforts to hire faculty 'stars' to lead major interdisciplinary initiatives. Three-fifths of respondents from research universities said their institutions offered start-up packages of $1 million or more in the sciences. More than three-fifths of respondents from public research universities (and half of respondents from private research universities) said they held competitions for funds to seed new initiatives. More than 80 per cent said they have introduced cross-disciplinary graduate training programmes.

More subjective questions yielded similar indications of strong interest in 'cutting-edge' fields and interdisciplinary

[60] *Ibid.*

[61] Even so, administrators often speak of 'return-on-investment'. The vice president for research at a Mid-Western university remembered the case of a $50,000 planning grant for research in strategic areas that led to a $1.8 million NSF grant. A vice president for research of a major research university in the American South noted, 'We are in the process of endowing a . . . fund for 'creative, cutting edge' fields. We have had a significant return on smaller investments in the past. One funded with $100,000 led to a $3.4 million grant from NIH'. At another university, the construction of state-of-the-art virtual reality labs have led to contracts (or expected contracts) from sources as diverse as Hollywood studios, the US Army, and Japanese multi-nationals.

initiatives.[62] More than 80 per cent of respondents from both public and private universities said their institutions had explicit strategies to develop 'creative, cutting edge, or high impact' fields in the sciences and applied sciences. Two-thirds of respondents from both public and private research universities said they had a strategy for developing 'creative, cutting edge, or high impact' fields in the arts, humanities, and social sciences. Remarkably, over half of respondents from both public and private universities said their institutions had adopted 'an explicit strategy' to emphasize interdisciplinary programmes 'as much or more than the traditional disciplines.' By contrast, fewer than 40 per cent of respondents from research universities (but 70 per cent of respondents from teaching universities) said their institutions followed an explicit strategy to build programmes in areas of increasing student demand.[63]

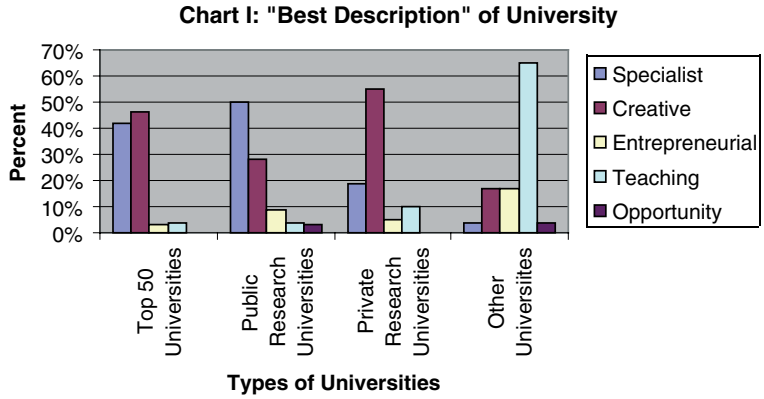
Overall, the responses suggest that the ideal of universities 'creating the future' is stronger in the private than in the State sector. When asked to choose the language that best describes their institution – and given five options – 55 per cent of the administrators of private research universities chose the phrase: 'We are a *creative* university, oriented to making distinctive contributions in high-impact fields.' This option was chosen by only about a quarter – 28 per cent – of public research university administrators. By contrast, half of the public university administrators chose the description emphasizing academic specialization: 'We are a university of *specialists*, oriented to making scientific and scholarly contributions

[62] These responses should be interpreted cautiously. The number of respondents in any single category is small. Some respondents may not have had all the facts in front of them when responding to questions regarding dollar amounts of competitions and start-up packages. Some respondents provided qualified responses. For example, administrators said their universities built in certain areas of high current student demand, but not in others. Although questions were phrased to avoid positive response sets, it is possible that some respondents may have given answers that they thought I wanted to hear.

[63] Some questions intended to investigate market-oriented self-concepts also elicited positive responses. Four-fifths of respondents said their institutions had adopted an explicit strategy to develop stronger university-industry partnerships. Nearly three-fifths said their institutions had targeted growth of Master's degrees in applied fields. More than two-thirds said they provided incentives for researchers through the recovery of a percentage of indirect costs. However, administrators also showed reservations about market-oriented behaviour. They rarely considered student demand an important factor in programme development, and most were lukewarm about expanding into new markets through distance education. Nor did respondents, when asked to select a description from among five choices, often choose the adjective 'entrepreneurial' as the best description of their institutions.

in a wide range of the major fields of knowledge.' This option, which expresses the traditional ideal of academic professionals, was chosen as the best description by only 19 per cent of private research university administrators (see Figure 1).

Figure 1



It seems likely that these striking differences are due, in large part, to the emphasis that private universities place on leadership. This emphasis can translate into a readiness to anticipate future opportunities. Public universities, by contrast, are rooted in the real and present needs of their own localities. Even at a time when State support of higher education is waning, public institutions express a strong commitment to the citizens of their States. The idea of the 'specialist university', whose experts investigate every sphere of knowledge, and reach out to every corner of the State, may share a special affinity with the Land Grant tradition of service.

The 'new directions' may hold the strongest appeal for upwardly mobile institutions – whether public or private – that lack the resources to compete for disciplinary eminence. For these institutions, the ideal of 'creating the future' presents an attractive 'way out' of an otherwise arduous and uncertain climb up the hierarchy of prestige. Such institutions include middle-sized universities that began as liberal arts colleges, and also some of the smaller technological universities. Other institutions in this category include poorly funded State 'flagship' universities, second-in-the State research universities, and some of the more ambitious public regional universities.

The associate provost of a middle-sized East Coast public university described the appeal of the 'new directions' strategy in terms of simple logic:

We are striving to become a 'creative university' in the future. We are devoting concentrated energies to it. That is a way of bettering our situation. Interdisciplinarity is a way to make up for competitive disadvantages. You can outdo the competition by doing something unique.

A vice president of research at a public regional university in the South predicted that it will be 'easy for us to move ahead in the current environment, because we don't have a lot of silos'. Many others acknowledged the appeal of the 'creative university' identity for institutions in transition: 'Ten years ago, (we were) a teaching college. Now we are very much moving down this other path.' A provost in the Northwest said, 'It is a way to bring greater visibility to our strengths. This is the direction in which we are going.'[64]

The Future of the 'New Directions'

The ideas underlying the 'new directions' clearly serve many different interests and constituencies. Governments and corporations want universities to contribute to new technologies. Minorities and women want universities to contribute towards a more equitable and inclusive society. Citizens want to be inspired and provoked, as well as informed. Professors want recognition for their contributions to new products and new ways of thinking. Administrators want to break out of the rigidities and reproductive tendencies they associate with departmental control.

Even so, we should ask: To what extent are these 'new directions' merely the product of an unusual conjunction of events? There are several reasons to think that the 'new directions' may turn out to be a passing fashion, rather than a continuing feature. Among the most important are the following:

1. Current visions of technology (and not necessarily basic science) as 'the endless frontier' may be the result of what amounts to a historical anomaly, produced largely by the successes of information technology and biotechnology. Some of the many technologies that are fueling the current enthusiasm for 'new

[64] Success in interdisciplinary areas of science and scholarship will generally depend on the same qualities of centrality, size, and wealth that are important for success in the disciplinary system. For these reasons, leaders of upwardly mobile, mid-size institutions are likely to be disappointed if they expect to find the pursuit of an interdisciplinary future inevitably leading to rapid advances in institutional standing.

directions', such as the demand for new homeland security, may not always be as significant as they are today.
2. The receptivity of Federal and the State governments to large-scale technology projects could easily wane. Ideological considerations have often limited these efforts in the past, and the current emphasis on strengthening systems of innovation could give way to suspicions of 'socialistic efforts' are being used to 'pick winners'. Budgetary cutbacks could have a similar impact. Indeed, in the wake of recent budget shortfalls, several States, including Alaska, Michigan, New Jersey, and Texas, have reduced or eliminated support for collaboration between universities, governments, and corporations in new technology development.[65]
3. An environment less hospitable to the accumulation of private wealth by the rich could limit the size of future gifts to universities, so effectively limiting the ambitions of university administrators. In this respect, our current era resembles none better than the Gilded Age, before the passage of the progressive Federal income tax in 1911. That age, too, produced both private wealth and privately-supported public institution building on a previously unheard-of scale.
4. It is even possible (although I think unlikely) that the increasing dependence of public institutions upon private funds will lead to a diminished concern for racial and ethnic access.

Balanced against these possibilities, several arguments support the expectation that the 'new directions' will remain important and permanent:

1. Japan has developed and China is developing successful national innovation systems. The European Union has announced analogous plans.[66] International competition will oblige governments and corporations to mobilize intellectual capital to compete in emerging markets.
2. The demographic revolution currently transforming higher education is far from complete. Minority populations will continue to grow, and populous States like Texas and California will become 'majority–minority' during the next decade or two. Moreover, university efforts to globalize, led by such institutions

[65] Geiger and Sá, *op. cit.* note 28, *Minerva*, 10–12.
[66] *Ibid.,* 1.

as Georgia Tech and New York University, may produce wider international contact, and more inclusive practices.

3. Broad (and less quantifiable) trends in the culture of advanced societies seem to be allied with the 'new directions'. The work environment now routinely requires multiple skills (political and social, as well as technical) and the capacity to juggle many tasks at once. The environment of consumption is filled with variety and choice. Information about any subject of interest is at one's fingertips. This daily experience contrasts sharply with the rigid procedures, access-controlled filing systems, hierarchies of experts, narrow job definitions, and highly defined social roles of the bureaucratic organizations that were universally familiar to previous generations of graduates. With the rise of bureaucracy, Max Weber argued, the cultivation of the 'generalist type of man', as the highest ideal of the educational system, was displaced by the production of the 'specialist type of man'. In the new environment, it is worth asking whether the production of the 'specialist type' will not in its turn give way to a new 'creative type'[67]. If so, the institutional changes discussed in this essay will gain further support from a new representation of the educated self.

ACKNOWLEDGEMENTS

One hundred and forty-four respondents, across the United States, gave generously of their time to answer my questions about university priorities and strategies. I would like to thank Charles S. Levy and Katrina Paxton-Jorgenson for their help in contacting respondents and scheduling interviews. I would like to thank Andrea Simpson and Lori Turk-Bicakci for research assistance. I would also like to thank Terry Nichols Clark, Roger L. Geiger, Patricia J. Gumport, Michele Renee Salzman, Neil J. Smelser, William G. Tierney, and the Editor and referees of *Minerva* for their valuable suggestions.

[67] Max Weber, 'Bureaucracy', in Hans H. Gerth and C. Wright Mills (eds.), *From Max Weber: Essays in Sociology* (New York: Oxford University Press, 1946), 243.

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