

The Celtic Tiger

Ireland invests heavily in higher education, and benefits mightily

Photos by Peter Matthews, Black Star, for CrossTalk

By Jon Marcus

DUBLIN

IT'S OPEN DAY at Trinity College, the day when the Irish equivalent of high school seniors come to look the place over. The historic quadrangle is swarming with 17- and 18-year-olds, some in their school uniforms—rumpled ties, tousled skirts—others in the logo-laden gear that is the uniform of teenagers worldwide.

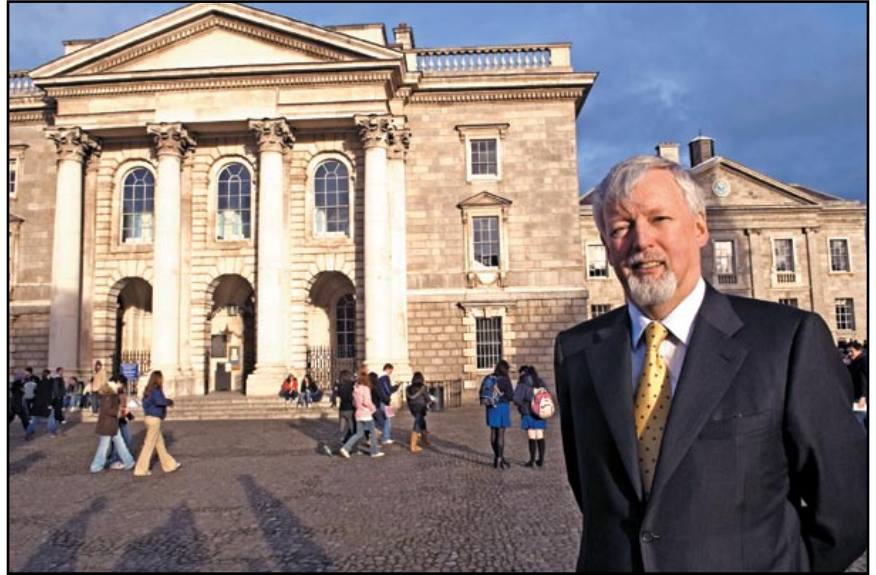
But these students are different from their international counterparts in one important respect: They don't appear nervous or uptight, worried about whether they will be admitted, can afford to pay tuition, or will have a job awaiting them on graduation. They have the calm, self-confident and optimistic look of young people who believe the world is at their feet.

And they're right. It is.

Ireland's extraordinary economic success means these students live in a society with one of the lowest jobless rates and highest growth rates in the world. Since the early 1990s, Ireland has gone from being one of the poorest countries in Europe to one of the richest. Its gross domestic product grew by a dramatic 9.5 percent per year between 1995 and 2000—nearly 60 percent in real terms during that period, compared to less than 16 percent for the European Union as a whole. The transformation is evident everywhere, from the Aer Lingus flight to Shannon crowded with Irish families returning from shopping sprees in New York and Boston to the hours-long traffic jams in once-sleepy Dublin.

Even through the relative downturn of the last few years, Ireland's economy—dubbed the Celtic Tiger—has continued to outperform those of other Western nations. In 2004, for instance, Irish GDP grew by 5.5 percent, compared to 1.8 percent for the rest of Europe. Unemployment has fallen from 18 percent in the late 1980s to less than four percent today. The students in the Trinity quadrangle can look forward to almost certain employment. The jobless rate last year for graduates of the school was just 1.6 percent, compared to the United Kingdom, where graduate unemployment exceeds six percent. Since the onset of the Celtic Tiger, the Irish have enjoyed a two-and-a-half-fold improvement in average material living standards. Income has gone from 35 percent below the European Union average to 20 percent above it.

Higher education itself is credited, in part, with this impressive turnaround. In the absence of jobs, or for the training needed to find work overseas, Irish young people have been enrolling in universities in large numbers for decades. "People traditionally in Ireland placed a high priority on education," said John Hegarty, Trinity's provost. "They saw it as a passport to succeeding anywhere in the world." Tuition



John Hegarty, provost of Trinity College, in Dublin, believes colleges and universities have helped to fuel the Irish economic boom.

for undergraduates was eliminated in 1995, and the number of students ages 19 to 24 in college ballooned from 11 percent in the mid-1960s to the current high of 56 percent—projected to increase again to 65 percent by 2015—compared to a higher education participation rate in the United States of 24 percent.

Meanwhile, the combination of a low corporate tax rate, a low-wage English-speaking population, and membership in the European Union (and access to its markets) helped attract the likes of Dell, Intel, Microsoft, Wyeth, Boston Scientific, IBM, Bell Labs, Apple, HP, Abbott Laboratories, and Google to Ireland, where they set up production facilities to make everything from pharmaceuticals to software; by 2002, Ireland produced half of all consumer software sold in Europe. The country had a large supply of well-trained university graduates to fill management and other professional positions at these fast-arriving multinationals. Citing prominent economists, an Organization for Economic Cooperation and Development (OECD) review suggests the university education of its population has accounted for almost one percent per year of additional Irish national output.

But there are fears that things are slowing down. In October, the National Competitiveness Council of Ireland said there were signs the Celtic Tiger was losing its momentum. Forfás—a board that provides policy advice to the government on trade, technology and innovation—warns that Ireland's high-tech manufacturing business is particularly threatened

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Jim Browne, registrar and deputy president of the Irish national university's Galway campus, believes there should be more emphasis on research and graduate education.

by competition from Asia. After 15 years of economic expansion, “Ireland has reached a turning point,” reports the nation’s Expert Group on Future Skills Needs.

Ireland’s success is part of its problem. Its rising standard of living has elevated the low wages that drew manufacturers in the first place. “One of the consequences has been a high-income society that needs to be even more competitive internationally if it is to continue to forge ahead in a period of slower economic growth,” the OECD said.

So policymakers are turning to the universities again in a unique experiment in tailoring a higher education system largely—and explicitly—to serve the needs of an economy. That system is to be a major part of moving Ireland from a nation that depends on technology-importing and low-cost production to one that is based on innovation. And it “requires that Irish (higher) education and research...become the new drivers of economic development,” the OECD said.

In the last 15 years, said Jim Browne, registrar and deputy president at National University of

Ireland, Galway, “education was important because it provided a skilled workforce. But what got us to where we are won’t keep us there.” The professionals with undergraduate degrees that the universities turned out before are skilled enough to manage, but they were not necessarily trained to innovate. “Now we need to invest in postgraduate education,” said Browne, who advocates churning out Ph.D.s and expanding research and development so that Ireland doesn’t only manufacture drugs and technology products, but also invents

them. “The conversion of knowledge into wealth is valued by universities here,” said Hegarty. “We do have to push this along.”

Trouble is, as successful as Ireland has been at furnishing undergraduate education, it is only now starting to do research or produce postgraduates in many disciplines, and in collective numbers smaller than some single-major research institutions in America and Europe. Universities are worried about attracting qualified students at all levels. The birth rate in largely Catholic Ireland, once a popular subject of derisive Monty Python skits, has plummeted from 23 per thousand in the 1970s (which was, in fact, twice the European average) to about 13 per thousand, meaning the number of students ready to enter college will have declined from 70,000 in 1990 to a predicted 53,000 by 2015. This at a time when two-thirds of new jobs Irish employers will create are expected to require a university education, compared with one-third in 2001. The estimated number of university graduates needed to meet demand is around 37,200 a year, while Irish universities are now producing only 32,500.

Computing and engineering programs are especially hard put to attract students. Increasing numbers of secondary school graduates don’t do well enough in math and science. Of the 51,000 who took the so-called leaving certificate exam last year, only 11,000 got honors in math, the prerequisite for most university engineering and technology courses. That was down eight percent from just the year before. More than 20 percent failed math altogether, 16 percent failed chemistry, 13 percent failed biology, and nine percent failed physics.

The Royal Irish Academy calls this a crisis threatening the very future of Ireland’s information-technology industry.

Ireland’s supply of Ph.D.s is also low compared to those in other European countries including Switzerland, Finland and the UK. In Ireland, among people ages 25 to 29, 1.8 percent are Ph.D. graduates —much lower than the European Union average of 2.9 percent. The total number of doctoral students in all of Ireland, while it has begun to climb, is only 4,500—again, not much more than at some major universities in other countries. Research has, until recently, been almost an afterthought.

As recently as 1997, the research budget in the Department of Education was zero. Ireland spends barely 1.4 percent of its gross domestic product on research and development, compared to 3.1 percent in Japan, 2.7 percent in the United States, and the European Union average of 1.9 percent. In another measure, only 70 of the 1,056 applications to the Irish patent office in 2004 came from higher education institutions. In all, Ireland submitted 86 patent applications to the European patent office per million population, half the European Union average and far fewer than Finland (338) or Germany (310).

Yet rather than collaborate, some Irish universities (there are seven, plus 13 institutes of technology) have been competing for faculty and are accused of duplicating costly research efforts. Government spending on higher education has remained constant at about 1.3 percent of gross domestic product, compared to 2.7 percent in the United States, 2.5 percent in Canada, and 1.7 percent in Finland.

And many faculty and students protest that administrators

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and the government are neglecting the humanities in favor of science and technology, and are converting universities into factories to fuel industrial growth—in Ireland, of all places, where the humanities have such historic cultural value. “Underlying these changes is an increasingly dominant view of the university system as a strategic component of the Irish economy and its development,” complained Gerald Mills, vice

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president of the Irish Federation of University Teachers.

“Ultimately, the question for all universities is simple,” proclaimed a report by the students’ union and graduate students’ union at Trinity—alma mater, after all, of Samuel Beckett, Edmund Burke, Jonathan Swift and Oscar Wilde.

“Does the university serve knowledge and education as an end in itself—in other words,

constitute an academic institution—or does the university perceive knowledge as a means to an end, in other words exist as a market-driven institution?”

Through the endless traffic and across the city, at University College Dublin, a degree-conferring ceremony is getting under way for mid-year graduates dressed in their academic robes and finery—saffron for Celtic studies, scarlet for health sciences, St. Patrick’s blue for science—in front of an audience of beaming relatives with flashing cameras. At the center of the stage stands Hugh Brady, an accomplished nephrologist who returned to the university from a ten-year stint at Harvard, and has since become its president.

It is the largest university in Ireland, with 22,000 students, but one that was widely seen as underachieving. Its own strategic plan, released in 2004, concluded that UCD had “significant unrealized potential.” A vast number of departments (90) and faculties (11), many of them tiny and often overlapping, led to an evident duplication of academic effort and discouraged interdisciplinary collaboration. Promotion procedures were archaic.

The sweeping changes Brady has already made at UCD symbolize the shift in Irish higher education—and the tensions it has been causing. He has adopted the American-style semester system, added a popular menu of electives, taken administrative responsibilities away from academic faculty, streamlined the route to promotion, begun a 15-year modernization of the bland 1960s- and 1970s-style campus, launched a branding and advertising campaign, and merged the 11 faculties into five colleges with new graduate divisions, and the 90 departments into 35 schools with five principals in place of the former academic chairmen.

In the future, a quarter of UCD’s students will be postgraduates, up from just under a fifth today. The university will be “research-led,” Brady has proclaimed, and will rank

among the top 30 universities in Europe—a huge ambition considering that UCD does not currently make it to the top 300 of the influential Shanghai Jiao Tong rankings of world universities or the top 200 of the Times Higher Education Supplement international league tables, where the only Irish institution that does appear is Trinity. Brady said he intends to make UCD Ireland’s premier graduate-level institution.

These changes may have gone over well with prospective students—the number who made UCD their first choice among Irish universities is up ten percent—but they have caused a drop in the morale of faculty, many of whom were stripped of administrative titles and power and merged into larger departments. There was no other choice, Brady said; within the kind of tiny enclaves that existed previously, “you develop bunkers and silos, and the more entrenched they become the harder it is to get people to talk to their neighbors. I think that’s true of universities in general.” Brady’s intention to make UCD into the top graduate university in Ireland didn’t do much to win the goodwill of other Irish university heads, either—especially when he started hiring star faculty away from National University of Ireland, Galway, National University of Ireland, Maynooth, and University College Cork.

The so-called “poaching” episode grew so heated it ended up embroiling the prime minister. Education minister Mary Hanafin scolded that poaching by the universities would jeopardize the nation’s economic plans. “Rather than competing on the small stage, we should be winning on the international stage,” she said. Brady finally signed on in September to an anti-poaching protocol that calls for open recruitment of faculty and contracts with senior researchers, including minimum periods of appointment.

Brady concedes that collaboration is fine, but still insists competition has its place. “You’ll never get rid of it, nor should you,” he said over coffee in a conference room after the conferral ceremony. “Institutions will still compete for the best academics. That does not obviate the development of trans-



Education minister Mary Hanafin occasionally must tamp down the competitive fires of Irish universities, especially in the bidding for new faculty members.

institutional research programs and research clusters,” an area in which UCD actually has been very active. “But if you try and force collaboration, it will fail. Some of the language (of Irish policymakers) suggests that collaboration is an end in its own right. The question is whether it adds value.”

The reason for the national government’s power over universities in cases like the poaching feud is simple: It accounts for 86 percent of their funding. And it is using money to steer policy. Spending on education in Ireland has soared from 1.74 billion euros a year in 1990 to six billion euros a year today, of which about 1.5 billion goes to the universities. (One euro was worth \$1.29 at press time.) And more money has begun to flow since higher education was put at the center of the national economic development strategy, much of it for research.

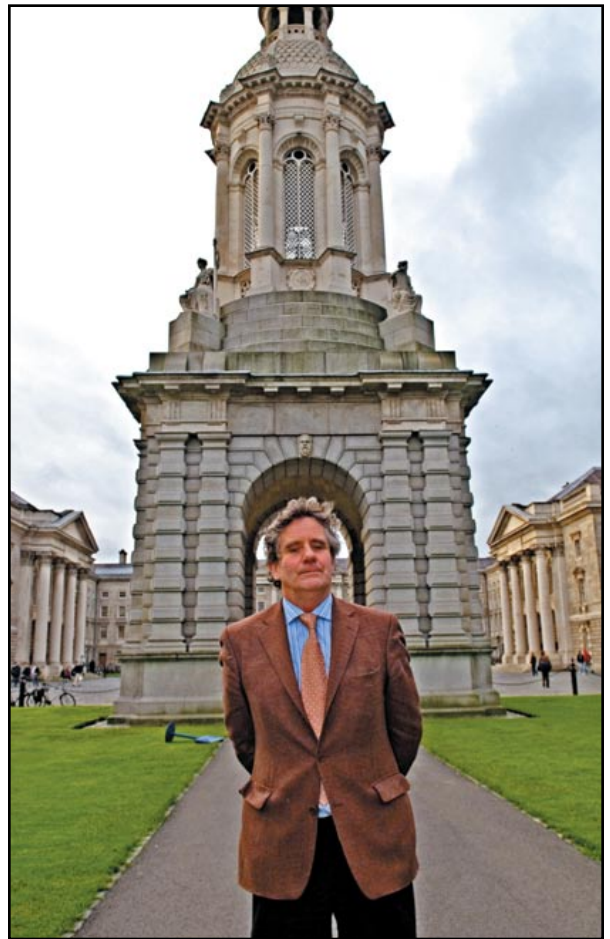
First there was the Program for Research in Third-Level Institutions, which from 1998 to 2002 committed 605 million euros to research infrastructure. Then came the Technology Foresight Fund of 711 million euros over seven years, mainly for information and communications technologies and biotechnology, which is administered by the Science Foundation Ireland, or SFI (modeled after the U.S. National Science Foundation). The SFI has already awarded more than 250 million euros for research and has invested 42 million euros in three new centers for science, engineering and technology to connect Irish universities with communications and biotechnology companies.

Other annual government funding for research has increased to 680 million euros, up from 334 million in 2000. Higher education’s share of that has helped the universities increase their research and development spending from 322 million euros a year to nearly half a billion, more than a 50 percent jump. In exchange, the government expects the number of doctoral students in science, engineering and technology to double by 2010.

In all, the government has earmarked 2.5 billion euros in the last five years for research, technology, innovation and development, a five-fold increase compared to the five years before that. In June, a 30 million euro fund was set up to improve technology transfer from universities to industry. “With our new strategy, what we’re saying is we want to take this idea of commercialization and translation of ideas and make that an equal part of the teaching and learning,” said Ned Costello, former assistant secretary of the Department of Enterprise, Trade and Employment (itself an indication of the tightening link between the economy and higher education), and the new head of the Irish Universities Association.

The best example of how money is being used to pull the universities into line with government economic policy is the new Strategic Innovation Fund, which will spend 300 million euros over five years to promote inter-institutional collaboration. In December, the government approved the first 14 projects under the fund, totaling 42 million euros.

Irish universities are not big enough to do the scale of



Sean Barrett, a senior lecturer in economics at Trinity College, is critical of the new emphasis on graduate education and research.

research that is needed, policymakers say. UCD’s ambitions notwithstanding, “None of us are big enough by ourselves,” said Browne, in Galway. Ireland can not afford seven universities if each of them tries to be world-class in every discipline, but it can create a network of collaboration, he said. “There are 105,000 students in the whole country. There are universities in other countries with that many students. If we all try to do everything, we won’t get anywhere.”

NUI-Galway, one of four constituent, but largely independent, universities of the National University of Ireland (the others are UCD, University College Cork, and NUI-Maynooth) has been making changes more quietly and with less turmoil than UCD and Trinity. “Galway and other Irish universities are relatively intimate. People already know each other,” Browne said in his office in the university’s quadrangle, a replica of Christ Church College at Oxford. “Change is always painful. But there’s more support for collaboration than people realize. If you talk about a public university, which is supported by the taxpayer, it has an obligation to society, to its stakeholders. It won’t be neat, but I believe there’s an imperative for change here.”

That change requires each university to specialize in a selected area, with the others as its partners, Browne said. “We could lead biomedical engineering, and others could be involved. Trinity could lead genetics, and we could be

Many faculty and students protest that administrators and the government are neglecting the humanities in favor of science and technology.

involved, and so on.” Given its location on the North Atlantic, Galway has already staked its claim to marine research. It also has made a priority of biotechnology, considering the large numbers of medical and biomedical companies—Medtronic, Bristol-Myers Squibb, Boston Scientific—in and around Galway, the fastest-growing city in Ireland. “We’ve been very strategic in the areas we’ve chosen,” Browne said. Research income has shot from eight million euros in 2000 to 42 million this year.

Outside the old quadrangle, the gleaming marine science building, built in 1991 along the River Corrib, already has a new wing under construction. The nearby National Center for Biomedical Engineering, built in 2000, is linked with the information technology department and other of the university’s divisions through bridges—physical manifestations of the interdisciplinary work Browne is talking about. In the sparkling lobby are artists’ conceptions of 20 more planned projects, including a 50 million euro engineering and human biology building and an expansion of the Clinical Sciences Institute, all part of a 400 million euro “campus of the future” unveiled in December.

The government strategy for forcing universities to focus on their research strengths has had an extraordinarily quick impact. “The strongly individualistic streak in the Irish psyche perhaps makes us not as good at collaboration as other countries, but the fact is that this is a small country with fewer resources than some others, making collaboration a necessity,” said Costello, who, before he left the government to take over as head of the Irish Universities Association, authored a policy-shaping plan to increase research by 2013.

“Competitive funding is going to start to bring about a natural clustering,” Costello said. “That’s going to give universities an idea of where their main strengths are. In pure Darwinian terms, that’s going to start to happen.” Added Trinity’s Hegarty: “The fundamental principle of how we move forward is to draw disciplines and institutions together. We’re searching for a model for collaboration. I guess we’re inventing one: inter-institutional collaboration, which gives you scale.”

UCD’s Conway Institute of Biomolecular and Biomedical Research, for example, which Brady was instrumental in establishing on his return from Harvard, has made the university an authority in these areas. Housed in a gleaming new building, the institute is a model of interdisciplinary cooperation. “As people started to think of how the building would work, they almost demanded that they be co-located with their collaborators,” said Brady. Wyeth Research has since agreed to locate a new 13 million euro discovery research group there.

The Center for Synthesis and Chemical Biology is a 26 million euro, UCD-led collaboration in the chemical sciences that also involves Trinity, and the Royal College of Surgeons in Ireland, and has attracted 17 million euros in funding for medical research projects. In all, research projects at UCD last year totaled 80 million euros, and the university filed 11 patent applications. Its most successful spinoff was for a mad cow disease test that has earned almost two million euros in royalty income.

The university also is developing a 30 acre “innovation

park” adjacent to the campus, where incubation space is already occupied by 23 startup companies, and where the new National Institute for Bioprocessing Research and Training (funded by the government to the tune of 90 million euros over seven years) will conduct pharmaceutical research in conjunction with Trinity and the Institute of Technology, Sligo. Ireland’s pharmaceuticals industry employs 20,000 people and accounts for nearly 30 billion euros a year in exports.

Trinity College has claimed genetics, immunology and neuroscience as its priority for research, declaring that it will become a world leader in the field. It has collaborations with Galway in the humanities and bioengineering, with the Royal College of Surgeons in Ireland in medicine, with University College Cork in science and technology, and with seven other Irish higher education institutions and Bell Labs in telecommunications.

Research income at Trinity rose from 57 million euros in 2004 to 64 million in 2005, the most recent year for which the figures are available. A 372 million euro strategic plan announced in October, aimed at making it one of the 50 best universities in the world, calls for emphasizing research, boosting the number of postgraduate students by 25 percent to 5,000, and recruiting 225 new faculty.

This has only worsened opposition from among the current faculty and students. Provost Hegarty, the school’s former dean of research and the head of physics who also studied, worked and taught in the United States, has already pushed through a restructuring program similar to UCD’s, despite resistance, including a new management system that allows for more interdisciplinary work while also tying the allocation of resources to the capacity of departments to generate funding.

“Trinity College is not an institute of technology, we are a university,” groused the report by the Trinity students’ union and graduate students’ union. “The Industrial Development Agency, Enterprise Ireland, and the Department of Enterprise, Trade and Employment are responsible for creating economic development, not Trinity College.”

Change is difficult in any organization, Hegarty responded, but harder in universities, which “are about ideas, and ownership of ideas, and can be supremely competitive. But this university has survived revolutions, uprisings, changing of regimes. The question is, how has it survived all of those things if universities are so monolithic? Everybody accepts that you have to prioritize research. There is a recognition that we have to change as society changes.”

Trinity senior lecturer in economics Sean Barrett is not convinced of this. One of the harshest critics of the changes at Irish universities, he believes they could actually increase costs and lower standards—not to mention shortchange graduates, given that salaries in areas like research and development and computing, careers into which the government is trying to push more students, are relatively low in Ireland. “There is no evidence from earnings data that increasing the budgets of physics and engineering departments will enhance either

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national economic growth or the earnings of graduates,” Barrett concluded in an article in *Administration*, the quarterly journal of Ireland’s Institute of Public Administration.

What really angers Barrett is the comparison of such things as Irish patent applications and research and development spending with those of countries like Finland. Despite the fact that Finland greatly outpaces Ireland in both categories, he points out, it has a 9.1 percent unemployment rate compared to Ireland’s 3.9 percent, and Irish annual growth rates over a decade were three and a half times those of Finland.

“Other countries should adopt Irish economic policy rather than Ireland adopt other countries’ R&D policies,” Barrett fumed in shotgun bursts. “This is an incredible success story except in the minds of the heads of universities. I don’t know what crisis these guys are dealing with other than the

one they’ve contrived. Did we get here by being stupid? We were doing extremely well; there’s no need to start dismantling the university system.”

At Trinity, the dismantling that Barrett speaks of has included merging his department with education, law, social sciences, philosophy, social work and psychology into a new Faculty of Social and Human Sciences. But he is not alone in decrying the apparent emphasis on science over the humanities.

“It’s a bit like the Unionist Party that used to run Northern Ireland: minority rule. The bulk of resources goes to the smallest cadre of students who are in science and technology instead of the humanities,” Barrett said. Because

secondary school graduates have lower leaving certificate scores in math and science than in the humanities, Barrett reasons, pushing them into science and technology courses will bring down the average quality of university students. “University students in Ireland are university students in the purest sense, to get an education, not just to get a job,” Barrett said. University administrators and government officials who he sees as tailoring Irish education to feed the needs of the economy “are old-style mercantilist philistines,” he said.

Not true, say the officials. “Our humanities scholars point out, and they’re right, that all of our Nobel prizes have been

in the humanities,” said Brady at UCD, whose graduates have included James Joyce. “One could form the impression from the public debate of late that the economic dimension is the principal preoccupation of our society,” Hegarty admitted in an opening address to the Irish Universities Association Conference on the

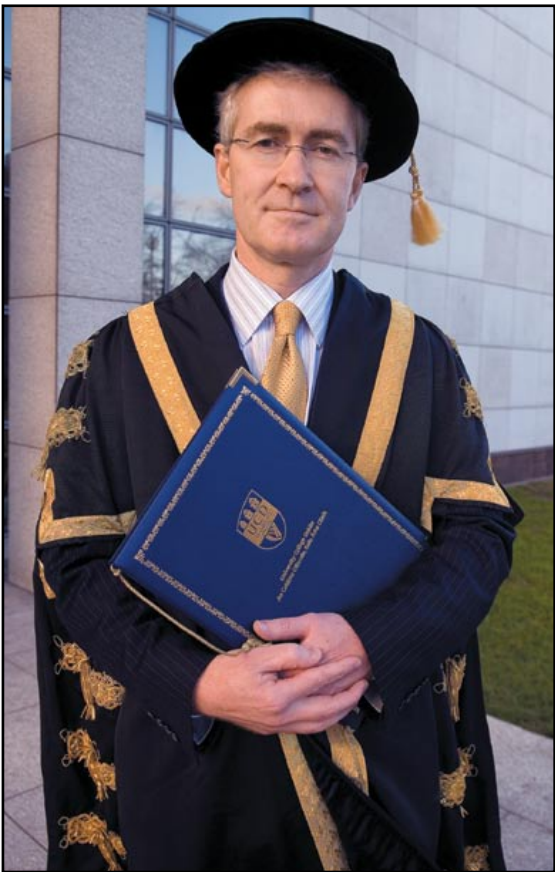
Humanities and Social Sciences on his campus in October. But he added that, especially at a time when great changes are transforming Irish society, “there is now a pressing need to rearticulate the critical importance of the arts, humanities and social sciences.”

In the high-ceilinged office of the 1760 provost’s house, hung with oil paintings of Edmund Burke and John Pentland Mahaffy (an earlier Trinity provost who was also Oscar Wilde’s tutor), Hegarty said the humanities are important to Ireland’s economy, too. “Foreign investment involves people, and companies are looking at the quality of the society they’re coming to,” he said. (“He may be saying he values the humanities,” Barrett countered, “but he’s been doing everything he can to undermine them.”)

Hanafin, the education secretary, repeated this idea. “Our universities are more critical than ever in helping us to make sense of these changes,” she said. “It is absolutely fundamental that we preserve a balance between the humanities and science. Failure to do so would be to ignore the essential responsibility of our institutions of higher learning in a civilized society.” ♦

Jon Marcus is a writer based in Boston who covers higher education in the U.S. for the (UK) *Times Higher Education* magazine.

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By concentrating on research and graduate studies, President Hugh Brady of University College Dublin hopes to build his campus into one of the top 300 universities in Europe.