# From Managerial to Entrepreneurial: Universities and the Appropriation of Corporate-Based Paradigms. An Historical Perspective from Europe and the United States

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## Introduction

During the past twenty-thirty years, universities have increasingly attracted attention as sources of inspiration for regeneration of industry or as sites of industrial innovation in itself. Traditionally, it is argued, universities have resisted this task, fearing that economic pressure and commercial interests might jeopardize the fundamental Humboldtian university values of "*Wissenschafts*-, *Lehr*- and *Lernfreiheit*" – intellectual freedom, autonomous search for truth, and basic research into problems formulated and pursued only for the sake of extending the frontiers of knowledge (Moraw 1984). However, by stressing out the complex mechanisms of interaction at stake between academic and business environments, recent sociological studies have challenged this oversimplified description. For sure, the ongoing rationalisation of the academic structure, the growing process of institutionalisation of industry-university connections (technology transfer offices (TTO's), spin-off companies, science parks, incubators, etc.), as well as the standardization of teaching and research criteria – put it briefly, the core elements of academic "modernization" – have contributed to render the "organizational shift" more visible to researchers. Moreover, with the help of a pompous rhetoric – "new production of knowledge", "second academic revolution" –, the role of universities in the "knowledge society" tends

now to be perceived as their "third mission" after teaching and research. This shift has undoubtedly paved the way to a profound transformation of knowledge norms within the academic community in general (Etzkowitz 1989), but it has also contributed to rephrase the conceptual framework through which research on universities is carried out.

However abundant and convincing the sociological evidence might be, it remains necessary to point out that the double process of organizational and structural academic change did not emerge *ex nihilo* in the last decades. Nor have these two trends occurred coincidentally or affected the universities worldwide equivalently, although it is true that patterns of homogenization can be tracked within various academic systems. In discussing the historical transformation of strategy and structure encountered by universities in Western Europe and the United States, I would like to question the connections between the rise of the model of the research university and the emergence of managerial conceptions in the reorganization of the academic sphere. That such linkages currently prevail does not imply that they were bound by necessity. Conversely, one should wonder how national academic systems would have responded to the increasing demands for scientific performance, the use of criteria of employability, and the adoption of better methods of governance stemming from and outside university milieus if it had not taken the paths of corporate-based rationalization.

In this paper, I will first attempt to show that the managerial view can be traced back (although not be reduced) to a long process of industry-university partnerships in teaching and research since the turn of the century up to World War II. Then, by focusing on the various models of academic organization, the second section will confirm that, despite common perceptions, the responsiveness of European and American universities to the societal changes has been permanent. In other words, I intend to carry on by different means the deconstruction of the myth of the "ivory tower", which has been frequently instrumentalized by the advocates of academic modernization. Recently, the "entrepreneurial" conception of the university has been credited for the viable alternative it provided to the decrease of public expenses for higher education. This latter stage is mentioned in the concluding remarks.

But before turning to the extensive development of these arguments, it might well seem appropriate to try to definite precisely what is actually meant when using such terms as "entrepreneurial" or "corporate" referring to universities (Keast 1995). As a matter of fact, there are a wide range of plausible expressions, which are by no means mutually exclusive (they rather complement each other in the field of practices [Cary/Watt 1999]):

- The extension of research, teaching, or financial partnerships between universities and corporations;
- The growing financial pressure exerted upon universities;
- The assimilation of corporate culture (e.g. managerial practices, accounting techniques, technocratic rhetoric) by the academic community;
- The design of university curricula and degree programs in function of corporate needs;
- The reorientation of scientific research towards corporate demands.

## 1. The Extension of the Research-Oriented University

The transition from the university in the original Humboldtian guise to its later development has bred lasting discussion among scholars. The ways by which German universities and their equivalents in Europe have progressively shifted from the scientific idealism of transmitting knowledge to the ideal promoting the advancement of a specialized research-based knowledge remain unclear. Clearly, the transformation of nineteenth-century European nation-states, with their corresponding trends of secular institutionalization and bureaucratization, has played a key role in this process. Another complementary approach consists in plainly acknowledging the fact that the Humboldtian set of reforms did provide the scientific framework on which the renewed autonomous institutional setting could take place, an appropriate setting "which later came to be co-terminous with the modern research-oriented university" (Wittrock 1993). The implementation of the modern composition of the university proved to be effective not only in continental Europe, but also in the United States where it was soon perceived as the "standard American University" by contemporary acute observers like Edwin Slosson, Laurence Veysey, or, to a certain extent, Abraham Flexner (Geiger 1985).

However fruitful and persuasive, the picture of the global research university such accounts should not overshadow the piece of evidence that, by the turn of the century, European and American universities remained by and large teaching institutions, where research activities were conducted by a minority of professors in their private laboratories. In fact, the infrastructures as well as the financial resources available for the support of university research in the years prior to World War I were mostly irregular. That is why, despite the gains of institutional and scientific autonomy, universities were not socially exclusive. They tried instead to constantly adapt to the situation by fostering voluntary dona-

tions, appointing personalities outside academic milieus as trustees or members of the Board of Directors, and becoming more responsive to the growing demands of modern societies. In this sense, two salient features should be borne in mind. Firstly, it was not uncommon that scientists sought to carry out their investigations with the help of private companies by the way of expertise or part-time consultancy. Such linkages were numerous, although uneasy to assess for the historian due to their informal nature. Secondly, in the wake of the "*Akademisierung*" of "useful knowledge" (Geiger 2000, Rae 1979), teaching capabilities became also effective in universities for vocational matters. The development of entrepreneurial knowledge for commercial and business needs fits also in this category (Locke 1984).

## 1.1 The Modest Scope of Industry-University "Research" Partnerships

When searching for the origins of the relationships between science – and especially academic or university-based science – and industry, one is somehow confronted to the egg-or-chicken paradox. On the one hand, modern industrial achievements have been made possible by the "translation" and application of scientific progress; on the other, the ever-growing needs of the railroad, the telegraph, and the wide array of new industries brought a multiplication in the demand for qualified personnel and the corresponding creation of vocational higher education establishments. Moreover, as the examples of Liebig in Giessen and Pasteur in Lille clearly show, scientists adhered to a conception of science freed from industrial needs (symptomatic of the closing of the "useful knowledge"), although their research interests were inspired by practical issues (Weingart 1978). The American experience in practice-oriented higher education differs slightly from that of the European scene. While in Great Britain, France and Germany, engineering subjects were taught in separate institutions (civic universities, "*grandes écoles*", or "*Technische Hochschulen*") inducing a dual system of higher education, in the United States such subjects were introduced early on in university curricula.[1] Nonetheless, most of the first interactions that operated between science and industry during the most part of the 19th century not only

1 Yale inaugurated its first courses in mechanical engineering in 1863, and Columbia University opened its school of Mines the year after. It must be noted, however, that specific institutions were also established in the United States (MIT in 1865 and the Stevens Technological Institute in 1871 to name a few) and that in Belgium engineering schools were directly integrated in the academic system.

took place outside the location of universities, they also occurred out of the collective configuration of academic communities. They mobilized cross-individual channels from various social and professional milieus typical of the pre-institutionalized era. Symptomatic of these inconsistent linkages were the rising activities of consultance performed by scientists for the local industry.

Following the generalization of the use of (mostly informal or tacit) knowledge for industrial purposes during the 19th century, industrialists progressively overcame their reluctance to employ university-trained technicians, engineers, or scientists. Qualified experts were called up for technical advices regarding instrumental devices, amelioration of production process or other interventions that required minimal scientific examination – and in any case could be coined as "research activities" (Fox/Guagnini 1999). Most of the time, for practical reasons, expertises and consultancy missions undertaken by scientists took place directly in the factory, for an irregular span of time, and with very limited established constraints. Andrew Carnegie witnessed this limited form of science-based innovation:

"We found […] a learned German, Dr. Fricke, and great secrets did the doctor open to us. (Ore) from mines that had a high reputation was now found to contain ten, fifteen, and even twenty percent less iron than it had been credited with. Mines that hitherto had a poor reputation we found to be now yielding superior ore. The good was bad and the bad was good, and everything was topsy-turvy. Nine-tenths of all the uncertainties of pig iron making were dispelled under the burning sun of chemical knowledge. What fools we had been! But then, there was this consolation: we were not as great fools as our competitors […]. Years after we had taken chemistry to guide us (they) said they could not afford to employ a chemist. Had they known the truth then, they would have known they could not afford to be without one." (Rosenberg 1985)

The "burning sun of knowledge", which Carnegie referred to, could take various paths. Once again, the so-called "scientification" of industry that followed the second industrial revolution mainly consisted in few technical improvements eventually leading to major industrial breakthroughs. The Bessemer process for mass-producing steel from molten pig iron did transform the general industrial and economic landscape although it did not involve the assimilation of complex scientific knowledge. The same is true for the invention of the multistage Solvay process for the manufacture of sodium carbonate that replaced the energy and

labour-intensive Leblanc process.[2] To repeat, pioneer industry-university connections usually stemmed from interpersonal networks, presupposed few or any approval by academic authorities, and did not demand specific requirements (Auger 2004, Sanderson 1978, Tweedale 1991). For some professors, and this was especially true within engineering departments, this industrial experience was more than a "service" offered to the community; it enabled them to pursue the same kind of practice-oriented experimentations they would have normally assumed in the locus of their university if only they had the appropriate infrastructure at their disposal. The poor conditions of academic research facilities also contribute to explain the eagerness with which, beyond the promise of supplemental private funds, professors were acting as industrial experts. Put it more bluntly, and permuting Clausewitz by the way, one could go on by saying that these forms of industry-university interactions were the continuation of academic research by other means.

## 1.2 Increasing Institutionalization

The modern paradigm of industry-university research partnerships, however, traditionally dates back to the complex interplay that took place during the last quarter of the 19th century between German academic laboratories and chemical plants such as BASF, Bayer and Hoechst – i.e. mainly in the coal-tar industry. Usually, three evolutionary stages are distinguished in the relationship: the erratic expertises undertaken by top-level members of scientific faculty for industrial purposes; an increasing formalization of previous sporadic activities through the launching of industry-sponsored research groups; finally, the development of in-house research laboratories staffed with university-trained chemists (Johnson 1985, Wetzel 1991). These research activities, whose different phases enabled the transition from faculty-industry to university-industry relationships, have attracted the attention of historians, eager to speak about the "industrialization of invention" in the light of the emergence of the science-based industry (Homburg 1992, Meyer-Thurow 1982) or to pinpoint the role of exceptional individuals in the shaping of a renewed alliance between scientific and industrial environments (Johnson 1992). From the beginning of the 20th century onwards, other industrial branches, which required scientific knowledge and innovation to expand their process and products (pharmaceuticals, photochemicals, etc.), would follow suit and emulate the patterns of coopera-

2 Interestingly, neither Henry Bessemer nor Ernest Solvay has received formal higher education.

tion observed in the coal-tar industry. As the number of industrial research laboratories increased, direct linkages involving university professors gave way to more complex forms of partnerships.

Interestingly enough, a so-called "pure science" led the way in the strengthening of research industry-university partnerships. Physics, and especially precise measurements, would create the same impetus for industrial research that organic chemistry had previously generated on the whole development of the flourishing synthetic dyestuff industry (Gooday 1990). At the eve of the 20th century, nonetheless, things started to change. Fields like chemical engineering and electrical engineering were institutionalized in American and European universities and were rapidly equipped with research facilities. It clearly reflected the predominance of disciplines of applied science – from "shop" to "school culture" – and the corresponding rise of the engineers as an influential professional and social group (whose perseverant lobbying to continuously adapt academic curricula to industrial needs cannot be understated [Lundgreen 1990]). The institutional background did not remain unaffected by the sudden legitimization of technological knowledge in higher education. In Germany, a form of "division of academic labour" prevailed: universities continued the teaching and research of chemistry, whereas electrical engineering became a special field in the *Technische Hochschulen* (König 1995, König 1996). The rigidity of this dual structure was somehow neutralized by the scientific prestige of technology-oriented research institutes, like the *Physikalisch-Technische Reichsanstalt* and, most certainly, by Kaiser Wilhelm's decision to give *Technische Hochschulen* the right to grant doctoral degrees, ensuring them co-equal status with universities (albeit no immediate academic recognition) from 1899 onwards (Cahan 1989, Manegold 1970).

In France, despite the implementation of the Parisian "grandes écoles" (Ecole des Ponts et Chaussées, Ecole des Mines, Ecole Polytechnique, Ecole Centrale des Arts et Manufactures), whose actual impact on the national innovation system should be reappraised (Belhoste 2003), experiences of industry-university partnerships mainly took place in the French Provinces. Under the influence of the German model, Mulhouse and the Alsace region can truly be considered as the seedbed of partnerships between local industrial sectors and academic departments (Olivier-Utard 2003, Shinn 1979). The analogy with the British case in this respect is striking: the Oxbridge administration in England was quite unwilling to foster the integration of practice-oriented engineering courses in its curriculum. The development of civic (redbrick) universities was a challenging response to the apathy of the elite higher education in this domain (of course many exceptions could be observed

on the individual stance). In Manchester, Glasgow, or Sheffield, the linkages between the academic and industrial environments clearly played a major role in the shaping of a curriculum in conformity with local needs (Sanderson 1972). Thus, the European experience, as diverse as it was, could stand the comparison with the American schools of engineering. Prior to World War I, the scientific excellence of some European technology-oriented research institutions, especially in the field of electrical engineering, and the performances realized by the MIT were pretty much akin. The differences were twofold: they laid in the mixed cultural appreciation of the needs of private firms to conduct research (with or without universities), on the one hand, and in the scope of industry-university cooperation – at national level in the United States, local in Europe –, on the other (Rosenberg 1994).

## 1.3 Cooperative Research

The institutionalization of research in industry has been one of the most striking phenomenons of the social history of twentieth century science and technology. Although for some major American firms from both electrical (General Electric, AT&T) or chemical industrial sectors (General Chemical, Du Pont, Kodak), the development of in-house research laboratories started around the turn of the century, the bulk of corporate research settings were established between the two world wars. Several factors explain the emergence of industry-based research and development: the complex structural reshaping of corporate capitalism, the merger movement following anti-trust laws, the necessity to use patents in order to keep existing markets and obtain new ones, the tendency to tame the process of scientific invention through organized cooperation (Mowery/Rosenberg 1998). The war gave this trend a remarkable impetus as scientific, industrial and government milieus mixed together to organize efficient military strategies. Joint science-industry institutions were set up in Europe and the United States for wartime purposes (the Department of Scientific and Industrial Research in Great Britain, the National Research Council in the United States) but their efforts, as successful they might have been, were put on hold after the end of the conflict, primarily because national governments ceased to approve their funding (Hull 1999, Kevles 1971). Still, both scientists and industrialists became aware of the range of possibilities that the application of scientific research could generate. On a practical stance, however, the borders between “pure” and “applied science” remained very porous. As Michael A. Dennis once put it, the specific engine of both industrial and

academic research, the laboratory, was a "portable" argument (Dennis 1987).

Meanwhile, the war had given full credit to faculty members willing to quicken the pace of conducting partnerships with private firms. In this realm, MIT was clearly leading the way (Etzkowitz 2002, Noble 1977). From the early 20th century onwards, MIT's electrical engineering courses had been sponsored by private firms. But chemical engineering also aroused the interest of industrialists. MIT's School of Chemical Engineering, established during the war, experienced at a larger scale the organization of contractual research projects that had already been activated prior to the war within the Research Laboratory of Applied Chemistry, set up by William H. Walker. Nonetheless, the research projects undertaken by Walker's staff for industrial firms (most notably for Eastman Kodak and du Pont) reached such an exceptional scope of business dependency that it awakened strong criticism from other research departments within MIT (Servos 1980). Similar controversies appeared in the case of the patenting policy adopted by the University of Wisconsin and the Wisconsin Alumni Research Foundation (WARF) following the discovery of the antirachetic vitamin D by faculty member Harry Steenbock in the early 1920's (Apple 1989, Weiner 1987). True, such academic-based industry-oriented research projects – coined as "cooperative research" – were not far from becoming commercial ventures. On the other hand, the scope of these activities remained exceptional in relation to the majority of modest fee-for-service arrangements that were performed in other academic departments, without any objection nor much publicity (Geiger 1988).

Contrary to a widespread belief, European universities did not remain aloof. Although they were far from reaching the scope of their American equivalents, academic research laboratories were also stimulated by the upsurge of industrial R&D, especially in electro-technical ventures: Siemens in 1920, Philips in 1923, AEG in 1928 (Erker 1990). Concerns like Rhone-Poulenc and Péchiney in France organized new forms of in-house R&D structures that were closely associated to general production management. Besides, the new wave of merger movements that occurred in the chemical industry (IG Farben in Germany, ICI in England, UCB in Belgium) relied on academic science and university-trained scientists to an extent that remains to be defined. In fact, the overall activities performed by European academic research centers for industrial purposes during the interwar years – including activities of cooperative research – deserve more attention (Garnsey 1992). As a matter of fact, such a reappraisal could be made connected with the recent historical findings confirming the impact of industrial R&D poten-

tial in England and Germany before 1940 (Edgerton/Horrocks 1994, Marsch 1994, Marsch 2000, Caron et al. 1995).

## 2. The Managerial Shift

In the decades following World War II, universities have progressively adopted "managerial" attitudes. This shift has resulted from the implementation of three main characteristics: (a) the inclusion of business-type courses for the training of business leaders; (b) the adjustment of scientific research to the norms of the marketplace; (c) the reshaping of the organization of academic administration along corporate guidelines. As we shall see, some sharp observers had already located in the early 20th century the primitive signs of this process – and most notably its segment (a). But the post-war context set the pace for an unprecedented reconfiguration of national academic systems. Two periods can be distinguished in this respect, both of them being closely related to the role of the State and the generalization of managerial ideology within the business and academic communities. Until the late 1960's, American and West European universities benefited from the increasing funding role of the State and the profound belief that institutions of higher education had to extend their activities in the development of modern societies and the launching of technology-related national economies. From the early 1970's onwards, however, despite the trends of academic democratization, the public expenses that were granted to universities started to decrease, forcing them to rationalize their budget and find alternative funding resources.

### 2.1 Antecedents: the Early "Corporatization" of Universities?

In an influential article published in September 1905, Henry S. Pritchett, president of MIT, asked the question: "Shall the university Become a Business Corporate?" (Pritchett 1905) Pritchett was aware that the American university, which he knew best, was adopting organizational methods and management techniques that originally belonged to a business corporation. The most interesting point in this assertion, however, was that Pritchett had written this note for the purpose of the Carnegie Foundation for the Advancement of Teaching (CFAT), endowed in the early 20th century, and of which he had been appointed president. As the General Education Board, sponsored by John D. Rockefeller and set up at the same time, the CFAT was an influential "think tank" whose aim

was to reform profoundly the higher education system. Quite similarly to other associations established during the "Progressive era", it was jointly composed by academics and industrialists striving to transform social structures into stabilized coherent and efficient organizations. It found in the theories of scientific management set forth by Frederick Taylor the sources of its inspiration for the development of such corporate conceptions. Unsurprisingly, shortly after Pritchett's statement, the CFAT brought out a research study that bore the unequivocal title *Academic and Industrial Efficiency*; it was written by one of Taylor's protégé and important figure within the progressive engineers, Morris L. Cooke.

Shortly after World War I, the unconventional sociologist Thorstein Veblen published his visionary book *The Higher Learning in America: A Memorandum on the Conduct of Universities by Businessmen*. Veblen argued therein that businessmen and lawyers were in the way of displacing clergymen as the leading social groups in the composition of governing boards and trustees at major private universities. Following the author, this shift had actual consequences – that were uneasy to pinpoint – not only on the general guidelines of university administration, but also on the remoulding patterns of the higher learning as a whole. Presumably, it was expected that, in case of emergency, wealthy industrialists and financiers would generously provide funding assistance to the universities they were enrolled in (Veblen 1957). According to the historian Clyde Barrow, the picture drawn by Veblen, although broadly valid for the overall American academic system, should be nuanced in function of the several institutional and geographic groupings that higher education establishments resorted to, i.e. ranging from Northeast private universities to land-grant colleges, where specific social composition slightly differed (predominance of financial groups, heavy industry, agriculture, etc. [Barrow 1990]).

Although challenging, the idea of the "corporatization" of universities – or "academic ownership" – analysed through the composition of governing boards bears some caveats. As a matter of fact, the traditional academic collegial system was not a priori incompatible with other forms of administration and governance. No *direct* connections between the administrative role undertaken by trustees and non-faculty members of the governing board, on the one hand, and the scientific tasks deployed by the academic community, on the other hand, can be clearly brought out (which, conversely, does not entail that *indirect* linkages did not operate). Actually, the rise of businessmen within governing boards at universities would not be a relevant issue in itself if it had not found an appropriate resonance through the integration of vocational studies in universities (Burrage 1993). In other words, the legitimization of business and engi-

neering education within academic institutions gives a far better indication on the process of academic corporatization. Most interesting in this approach, is the way by which these two rival segments of professional education did cross one another in the academic context so as to create the favourable conditions for the expansion of organized capitalism. On this peculiar stance, European universities did not lag behind American institutions or, better said, were not reluctant to catch up with US establishments. The efforts made by Henry Le Chatelier's to integrate his principles of "*science industrielle*" into the French faculties, as well as Eugen Schmalenbach's perseverance to promote the diffusion of "dynamic accountings" and the basic knowledge of *Betriebswirtschaftslehre* at a university level are just two striking illustrations of this trend.

Despite the rapid institutionalization of university-based business schools and their diffusion throughout European campuses after the Second World War, equivalent views were not to be found in the United States prior to 1940 (Locke 1984, Tribe 1994, Redlich 1957). In a later stage, the insertion of management studies into universities, first in Great Britain, then gradually elsewhere in continental Western Europe, would confirm the ascendant of American methods of business administration, which, as Europeans would soon discover, had to be considered rather as a science than an art. The "cultural transfers" in this case had made use of three different vectors: interpersonal or informal linkages operating during the interwar years (via educational and cultural exchange agencies, philanthropic foundations, and private contacts between American and European university administrators); the development of Marshall Plan-sponsored technical assistance programs involving universities during the immediate post-war period, and finally, the direct establishment of U.S.-based educational institutions in Europe in the 1960's (Gourvish/Tiratsoo 1998, Gemelli 1998).

## 2.2 The Second Post-War and the Generalization of "Opportunistic Niches"

Terry Shinn has convincingly argued that the social configuration of science, which prevailed after 1945, took the form of a process of "opportunistic nitching" between suppliers and buyers of scientific activities (Shinn 1999). Obviously the model also suited to universities, as they were gradually engaged in the elaboration of costly projects between academic research laboratories and private firms, and were favourably inclined to establish business schools or other forms of management training centers in their buildings. The dissemination of managerial patterns into the academic community was a direct effect of the irresistible spreading of scientific knowledge into the economy. As

spreading of scientific knowledge into the economy. As Henry Etzkowitz put it, "the introduction of economic values into science follows from scientists' successful quest for the capital and logistical resources to achieve their objective: the extension of certified knowledge." (Etzkowitz 2002) Conversely, what made the post-war certified knowledge so characteristic in comparison with the interwar period was its extension in the economic environment, and more precisely, its irreversible extension. The phenomenon was undoubtedly anchored in the era of Big Science, and in the willingness of outside agencies (in complement with the growing share of public support) to assist universities to cover their research activities (Geiger 1993). On the other hand, academic administrators took advantage of this situation as they started to implement new forms of managerial strategies and attract a wide array of industrial sponsorships in order to boost the potential performance and attraction of their university.

What requires our attention in this respect is the narrow connection that was soon established between the managerial way of doing academic research and the increasing perception of the university as a corporation. In this process of redefinition, key actors on the American side were men like Vannevar Bush, Frederick Terman and, in a second stage, Clark Kerr. As MIT professor and Dean of Engineering, Bush knew better than anyone else the potential impact that academic research could have on industrial innovation. For years he had himself undertaken consultancies for private firms, had hold patents and founded a company focused on the application of early electronic technology. But it was most notably during World War II, as initiator and leading figure of the Office of Scientific Research and Development (OSRD), that he made full use of his private networks among academic and industrial milieus in the Boston community in order to promote durable relationships between research universities, private firms, and federal agencies (Owens 1994). His celebrated book published at the end of the war, *Science, the Endless Frontier*, made clear the necessity to organize university-based research with the financial intervention of the State, but without its intrusion in academic affairs. The National Research Foundation created shortly thereafter embodied this conception of science-making (Kevles 1977). In a similar – albeit more explicit – approach, Fred Terman, Stanford University professor, dean of engineering, and provost (1955-1965), encouraged all activities that enabled the reinforcement of industry-university partnerships. His model of regional university-based economy, which resulted in the making of the Silicon Valley, grew out of his wartime experience as a former member of the laboratories organized by the OSRD. Like Compton and Bush, Terman's purpose was to extend to

all academic departments the contractual model based on industrial patronage that prevailed for engineering schools. In the name of prestige and performance, university faculties were asked to adopt corporate-like measures of efficiency that would provide evidence for their scientific achievements (Leslie/Kargon 1996, Lowen 1992).

On the European stage, the regime of inter-individual research cooperation between industry and academia was not superseded by public programs. On the contrary: the presence of the State reinforced the patterns of opportunistic nitching by allocating funds to research projects, which had previously operated below the radar of institutional scrutiny. The birth and early development of national science policies in the 1950's confirmed the disposition toward the normalization of managerial attitudes and the legitimization of managerial patterns within the academic community.

## 2.3 The Multiversity as a "Conglomerate" University

Fours years only separate Clark Kerr's 1963 vision and thoughtful analysis of the multiversity from Jean-Jacques Servan-Schreiber's influential portray of *The American Challenge* for European countries. Both of the authors were convinced that the future of Western industrial capitalism laid in its ability to make a wider use of expert knowledge in order to bring about new forms of economic gains. Moreover, Kerr and Servan-Schreiber trusted the prestigious American research university to be the appropriate institutional tool that would ensure this transition. In Kerr's view in particular, nurtured by his research interest in industrial relations and his practice as chancellor and president of the University of California Berkeley, the best institutional frame was the most flexible one. He coined a new concept that translated the transformations at stake in the academic environment of the 1960's – the multiversity. In *The Uses of the University*, he described the multiversity as a "mechanism held together by administrative rules and powered by money" (Kerr 1963). In contrast to the modern university, the edges of the multiversity are "fuzzy"; however, contrary to the pre-modern university, it remains an institution, albeit fractioned and dismantled. This vision led him to draw several comparisons between corporate and university organizational systems, the latter being inspired by the former. As he noted in his inaugural address in 1952:

"The university's function is to choose enterprising men and to provide the conditions whereby their enterprise may be successful […]. Freedom for the academician in the university serves a public purpose just as does freedom for

the entrepreneur in his marketplace – and it is the same purpose: quality and progress for the society." (Soo/Carson 2004)

Depending on the nature of Kerr's rhetoric magnitude, the multiversity bore two significations. As a symptom observed in the mid-1960's, it was a clear-and-cut echo of the growing process of fragmentation of university research and teaching departments, which took place in the United States as well as in Europe and facilitated the implementation of entrepreneurial forms of research practices (Pestre/Jacq 1996). Taken as a conceptual construct, however, the multiversity can most certainly be considered as a visionary sketch of the gradual trend of "dis-academization" that emerged from the 1970's onwards. After the social upheavals that shook the campuses throughout the world, hybrid industry-university research centers started to flourish and drain the research potential of academia. Universities' quasi monopoly in the supply of knowledge was soon eroded. Inspired by the seducing prospects of the multiversity, university officials replied by making the place more attractive for investors. On the one hand, scientists were asked to coordinate their research activities when dealing with industrialists; on the other, it was clear the quest for performance and efficiency hastened the fragmentation of the university between rentable and non-rentable faculties or research departments.

The adoption of a corporate ethos by university authorities has not produced the same impact in Europe and the United States. As Nathan Rosenberg argued, "US universities have responded, far more quickly than universities in other OECD countries, to the commercial opportunities held out by (recent scientific) discoveries as well as to the scientific opportunities" (Rosenberg 2003). This was due both to the practice-oriented origins of the land-grant movement, but also to the extent of the intervention of the State. In a way, the drop of the post-war "federal grant" university in the 1970's was just a reminder addressed to university administrators that they had to find out themselves the appropriate means for their institution to grow further and remain competitive. Leading universities could easily find a substitute for the federal angel; it was not the case for the large majority of them, forced to develop creative methods of alternative funding. In Europe, where the public involvement has been embedded in national educational systems, the situation proved to be more harmful. Although not a new phenomenon, renewed mechanisms of industry-university relationships have epitomized the blueprint of science policy in Europe. In response to the ever-widening gap between American and European industrial innovation, the institutionalization of managerial practices has tended to become a "top down" process.

That is true, although what is really new in this situation, as Henry Etzkowitz has observed, is that "many academic scientists no longer believe in the necessity of an isolated 'ivory tower' to the working out of the logic of scientific discovery" (Etzkowitz 1999).

## Conclusion: Are Universities Turning Entrepreneurial?

In his study *Creating Entrepreneurial Universities*, which relied on five European case studies, Burton Clark, professor at UCLA, singled out five pathways of institutional transition from public-funded to successful entrepreneurial universities: the strengthening of the steering core, the increasing development of the periphery, the reinforcement of financing autonomy and capacity, the academic teambuilding, and the diffusion of entrepreneurial faith among the scientific staff and the faculty (Clark 1998). At first sight, the call for a deeper institutional centralization makes Burton's view of the ideal entrepreneurial university obviously incompatible with Kerr's principles of flexible multiversity, although they both dig regularly in the phraseology of "corporate performance". On the practical scene, however, the two concepts seem to overlap inasmuch as American and European universities converge towards increasing institutional and organizational flexibility. The current shifts of governance not only reflect a modification of academic strategy – as previously shown, universities' responsiveness to social changes has been permanent throughout history (though sometime differed) –, they disclose a profound transformation of structural patterns. Clearly, a new regime of academic organization filled with managerial techniques, corporate-based methods, and entrepreneurial credo is being implemented in the various national education systems.

As I tried to show, this regime was introduced by entrepreneurial scientists rather than imposed from outside hostile environments. It came long after the legitimization of managerial attitudes within the academic community itself. It is ironic, therefore, to see that advocates of academic modernization continue to rely on the myth of the ivory and claim newness and modernity while they constantly ignore universities' history in this respect. As a result, the perception of a "second academic revolution" should be tempered by the fact that universities have conducted economic and social activities before being labelled as university's "third mission". However, the difference within the entrepreneurial regime lies precisely in that the so-called "third mission" tends to formalize and institutionalize – somewhat brutally – specific practices

and impose them to the university as a whole. Such forced embeddedness is naïve. As the various historical phases have demonstrated, if universities adopt and generalize (rather than select and adapt) practical and conceptual tools that are alien to its functioning, every attempts to reform and improve its structure will remain largely counterproductive.

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