

The 'Two Cultures' in Nineteenth-Century Portugal: Scholarship v. Science in Higher Education

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Abstract

In the nineteenth century, the Portuguese *intelligentsia* addressed one of the issues that confronted them with other European countries: the need to face the challenges of industrialisation through educational reform. This paper focuses on the main issue of university reform at a time when the only university in the country, Coimbra, showed signs of excessive conservatism both in its syllabus and teaching methods, and was confronted with new proposals for the introduction of technological disciplines or the creation of polytechnical schools. A parallel will also be drawn with the ongoing debate on the same subject in England.

Keywords

University, education, culture, tradition, science

In the well-known Reith Lecture of 1959, C. P. Snow stressed what appeared to him to be a major cultural problem in Western society: it was "increasingly being split into two polar groups ... the literary intellectuals ... and the scientists" (Snow 1978: 3-4). For Lord Snow, a huge gap had evolved between these groups, separating them into two different cultures, which did not communicate with each other and, worse than this, could even be hostile to each other. This polarisation generated an immense intellectual loss. For Snow, the situation required drastic measures, involving the breaking of a longstanding pattern of education at all levels.

This pattern was set in the nineteenth century, when education became both a major social problem and a major solution for social problems. Different diagnoses were made of the social situation and different solutions were attempted, involving a broad range of responses: from childhood to adult education; from innovation in methodology to innovation in content; from reform of the old institutions to the creation of countless new ones. But, already in the early nineteenth century, the main line of argument was whether education should focus essentially on the formation of the character through the study of the classics, or whether it should follow utilitarian guidelines and prepare young people for a useful profession, helping to increase technological capabilities and to meet the challenges of industrialisation. Or, to quote the words of Robert J. C. Young:

A sublime elevation versus a rational ground, a glorious truth versus vulgar utility, knowledge for its own sake versus debasing instrumentality, quality of mind versus practical needs, the universal versus the particular: such were the terms of the debate which, in spite of local variations, has remained the basis of discussions of university education from that day to this (Young 1996: 188).

This paper seeks to compare the way the English *intelligentsia* pondered the role of education in general and of the universities in particular, in the decades of swift industrial change from roughly the 1820s to the 1860s, with the concerns shown by the Portuguese *intelligentsia* in relation to the same subject. Roughly the same questions were raised, and, as Robert Young said, they still remain much the same today. We can perhaps summarise the main problems faced then and now under three main headings: 1) the opposition between literary and scientific knowledge; 2) the nature of the institutions of higher education dedicated either to the one or the other, i.e. universities and technical schools; and 3) the nature of state intervention in institutions of higher learning. We could, of

course, extend this discussion into other relevant areas, such as the relationship between teaching and research, the awarding of academic degrees, careers in higher education, social access to the university and to technical institutions, and many others. We would probably find that the nature of these problems has not changed significantly in the past 150 years.

In the second half of the eighteenth century, a group of dissenting academies had already begun to create alternatives to the more conservative universities. Many elected English as the medium of instruction instead of Latin, and were concerned with the study of the natural world. Students were encouraged to specialise and Natural Science was taught through experimental methods. The seeds of what was later to develop, in the works of Jeremy Bentham, into utilitarianism and chrestomathic education, had already been sown in dissenting academies by Joseph Priestley, who outlined the doctrine of the greatest happiness of the greatest number. Many students went from these academies to Scottish or continental universities, where the natural sciences were taught, and on their return applied their knowledge to local industries. At the end of the eighteenth century, we can already notice that English and Scottish universities offered not only different syllabuses, but also that the nature of the institutions was quite different.

As Elie Halevy points out, "when a boy left school he proceeded to the University. He became a *student* at one of the four Scottish universities, Edinburgh, Glasgow, St. Andrews, Aberdeen, or an *undergraduate* of Oxford or Cambridge. To the two terms correspond two distinct types of university" (Halevy 1987: 469). The Scottish universities offered entrance at about the age of fourteen, whereas Oxford and Cambridge admitted undergraduates at more or less the age of eighteen. Therefore, the Scottish universities could hardly be regarded as institutions of higher education. On the other hand, the course of studies, which took four years, or four "sessions", as they were called, was almost exempt from the study of the classics and focused mainly on a philosophical education. The first session was spent on the study of Latin and the beginnings of Greek. The second was devoted to Logic and the third to Moral Philosophy, which included the philosophy of history and political economy. The fourth session was dedicated to the study of natural philosophy, i.e. physics and chemistry. In addition, there was a special course in mathematics during the second and third years, which served as a basis for the study of natural philosophy. "It is the curriculum, comprehensive without being overburdened, of a superior type of secondary education. England did not possess its equivalent," stresses Halevy (id.).¹

The students who wanted to follow a profession, whether in the ministry, law or medicine, would then progress to a specialised school and receive professional training. It is worth mentioning that the medical schools of Scotland were particularly famous.

Other characteristics marked a distinction between Scottish and English universities: in Scotland, the students were non-collegiate, living in lodging in town and only attending the lectures, which were public, for twenty-two weeks, the duration of each session. The fees were payable to the professors, a system that Adam Smith praised in the fifth book of the *Wealth of Nations* as stimulating free enterprise and competition, thereby increasing the quality of the lectures. On the other hand, the universities of Oxford and Cambridge, heavily endowed by the Church of England and private funding, seemed to favour idleness and a lack of interest on the part of the tutors and fellows, who earned their salaries whether they lectured or not (Smith 1998: 422, 588 n.).

In spite of occasional interest shown by the two universities of Oxford and Cambridge in the study of the natural sciences in the eighteenth century and the endowment of chairs in fields such as botany and experimental philosophy, together with the creation of laboratories and observatories, the fact remains that, in the early decades of the nineteenth century, education in both universities was mainly dedicated to the study of the classics as the proper knowledge for a gentleman. Nevertheless, the torpor into which both universities had fallen began to be shaken, as criticism began to mount in articles published in the *Edinburgh Review*, for instance, in 1810, which elicited a vehement response

¹ Thomas Carlyle is a well-known example of a student at Edinburgh University at the beginning of the 19th century. He was admitted in November 1808, one month before he turned fourteen. His impressions of the university can be found in *Sartor Resartus* and in some essays, namely his *Address* to the students of the University when he was elected Rector in 1866. The first volume of his biography by James Anthony Froude also contains a description of the conditions of life at the University at that time.

from E. Copleston², or in comparisons with the Scottish and German universities, and even with the reforms of the French higher education system promoted by Napoleon.³

But the main challenge to Oxford and Cambridge came from within England, and not from without. Until the mid-1820s, the alternatives to the Anglican universities had been mainly the dissenting academies, which had no university status. But, in 1826, a new University was formed, this time with a secular orientation. The Benthamites and the Dissenters founded the University of London in 1826, “as an alternative to the somnolence of Oxford and Cambridge” (Hobsbawm 1980: 339). It started in a disused rubbish dump on Gower Street and was at first little more than “a joint-stock medical school”, for, by 1834, more than half of its students were studying medicine and attempts to enlist further professional groups such as mineralogists, engineers, designers and educationalists had failed (Armytage 1964: 103). But, nevertheless, a revolution had been started: London University was the first to admit students without a religious ‘test’, and it stressed its secular and utilitarian orientation. Besides, it was a non-residential university and its funding was run on private lines. The radicals, Brougham, Birkbeck and Francis Place, provided the secular and utilitarian frame of the syllabus, Isaac Goldsmith, the financier and philanthropist, the main funding.⁴

The challenge set by the “Godless” curriculum of London University was enough to stimulate the Church Party, which founded King’s College, in the Strand, in 1828, followed by Durham University in 1834 (cf. Perkin 1994: 298). King’s, though specifically Anglican and offering “religious and moral instruction”, made similar concessions to preparation for the professions and enrolled a majority of medical students, as London University had done. Both colleges appointed professors who were not only scholars but were also distinguished in the applied sciences. Among the first five professors at Gower Street, three were graduates of the University of Edinburgh: Anthony Panizzi, who later built the great reading room of the British Museum; Leonard Horner, who founded the Edinburgh School of Arts; and J. R. McCulloch, the expositor of the ‘Wages Fund’ theory. King’s College enlisted the services of J. F. Daniel, the inventor of the hygrometer, who took the chair of Chemistry, and Charles Wheatstone, the pioneer of spectrum analysis and submarine telegraphy, who took the chair of Physics.

The two colleges were joined by charter in 1836, under the name of London University, and the institution at Gower Street became known as University College. The new university was organised in a completely different way from Oxford and Cambridge: not only did it stress its emphasis on professional education, but it was also concerned with offering opportunities for higher education to the middling and lower classes. By 1851, it was offering degrees to 29 general colleges and 60 medical schools spread all over England. Harold Perkin sums up the challenge posed by the Benthamites to the conservative forces in English society:

² Writing in the *Edinburgh Review* in 1809, Sydney Smith attacked the classical education that formed the syllabus at Oxford. The grounds for his criticism were the lack of utility for future life afforded by “the great system of facts with which [the student] is the most perfectly acquainted.” And these were “the intrigues of the Heathen Gods: with whom Pan slept? – with whom Jupiter? – whom Apollo ravished? ... Now, this long career of classical learning, we may, if we please, denominate a foundation; but it is a foundation so far above ground, that there is absolutely no room to put any thing upon it.” In 1810, Edward Copleston, Professor of Poetry, published *A Reply to the Calumnies of the Edinburgh Review against Oxford*, followed by a second, and then a third, reply. Among his arguments in defence of the Oxford syllabus was the idea that classical literature provided a common culture and a common link between conflicting sets of ideas, as well as unprejudiced feelings, and this was the utility of a classical education: “And thus, without directly qualifying a man for any of the employments of life, it enriches and ennobles all.” (Cf. Young: 188).

³ In Germany, the creation of Berlin University, and the publication of the works of Humboldt, Schelling and Schleiermacher provided a new model for the University, where both teaching and research were to be conducted, free from state intervention. In France, under strong state direction, the Sorbonne was dismembered and polytechnical institutions were created, such as the *Grandes Écoles*.

⁴ Both Birkbeck and Brougham came from Scottish universities. Birkbeck had been professor of chemistry and natural philosophy in Glasgow, before he became a physician in London, where he played a leading part in the formation of the London Mechanics’, or Birkbeck, Institute in 1824, now Birkbeck College. Brougham was a graduate of the University of Edinburgh and was one of the founders of the *Edinburgh Review*.

...[I]n spite of the failure of the Benthamites and their allies to create alternative systems of education for the various classes capable of completely replacing those of the aristocracy and its Church, they were able to stimulate the latter to reform and extend the existing provision and to do so in accordance with the spirit of the entrepreneurial ideal (Perkin 1994: 294).

The project behind this new departure was Jeremy Bentham's *Chrestomathia*, which means "useful knowledge". The full title of the work, *Chrestomathia, Being a Collection of Papers explanatory of the Design of an Institution, proposed to be set on foot under the name of the Chrestomathic Day School, or Chrestomathic School, for the Extension of the New System of Instruction to the higher Branches of Learning. For the Use of the middling and higher Ranks in Life*, shows that it served more than one purpose. It was, on the one hand, a blueprint for a new kind of school, to be built on the panoptical plan⁵ and managed under new guidelines. On the other hand, it set forth a new programme of studies, which, according to its author, would afford access to reasoning and knowledge, guaranteed to produce the happiness of the greatest number. The syllabus provided in *Chrestomathia* was conceived for the instruction of children up to the age of fifteen, but it could be expanded and followed along more specialised lines in further education. Since the chrestomathic project formed the basis of a whole concept and philosophy of education, developing into higher education, it is important to look at the main lines of the argument and follow its impact on the Portuguese system of education.

Bentham gives full credit to a few predecessors, who had developed what he calls the "scholar-teacher principle", above all Dr. Lancaster and Dr. Bell. The system consisted in the employment of "the most advanced, and in other respects most capable, among the *scholars* themselves" as "*teachers* to the rest" (Bentham 1994: "Chrestomatic Tables": Table II, 8)⁶. This system, which included another two degrees, scholar-tutors and scholar-monitors, was designed to enable one single Master to be in command of a room of 1000 pupils. The advantages of the system are fully presented by the author, who stresses that "the application of this principle is ... not a *make-shift* occasionally employed, as under the old system, for want of a supply of *grown-up* under-Teachers, - but an *essential feature*, operating to the complete and *purposed* exclusion, of all such naturally reluctant and untractable subordinates" (id.: 9). The enforcement of discipline was another main feature of the new project. Bentham was against corporal punishment and devised an intricate system of rewards and punishments that worked psychologically, in large part through the effects of the panoptical architecture of the school, which provided the means for a constant inspection of individual work and performance. By means of this system, large numbers of students would then be fully instructed in a course of studies which was completely secular, designed to provide useful encyclopaedic knowledge and be open to boys and girls on an equal footing.⁷

But what is also interesting in *Chrestomathia*, though much less stressed in comments on the work, is the second part, which Bentham calls An Essay on Nomenclature and Classification: including a critical Examination of the Encyclopaedic Table of Lord Bacon, as improved by D'Alembert; and the first lines of a New One, grounded on the Application of the Logical Principle of Exhaustive Bifurcate Analysis to the Moral Principle of General Utility. Here, Bentham devises a whole system of thought designed to replace the long line of logical thought from Aristotle's *Organon* to Bacon's *New Organon* and the work of the French Encyclopaedists, which was grounded on Bacon's *The Advancement of Learning*. Bentham's project consisted in the

⁵ The *panopticon* was a circular building, conceived to ease the tasks of surveillance and discipline. Bentham's project could be applied to schools, prisons, workhouses, hospitals or barracks, ensuring that discipline could be maintained without recourse to physical force. Michel Foucault devotes a chapter to "Panopticism" in *Discipline and Punish: The Birth of the Prison*. Translated from the French by Alan Sheridan. London: Penguin books, 1991.

⁶ Our edition of Bentham's *Chrestomathia* is a reprint of the first edition of 1816, where, from page 68 onwards, Table II is introduced, without pagination, after which the pages are once again numbered, starting with page 2.

⁷ Dickens gives a vivid description of a school based on the utilitarian model in the opening chapters of *Hard Times*, where not only the schoolmaster and the pupils, boys and girls, are featured, but also Mr. Gradgrind and a third gentleman, who was probably a caricature of Henry Cole.

development of a system of logic based on Eudemonics, i.e. felicity, conducive to the well-being of the greatest number: once a pupil at the chrestomathic school could master the system, he or she would attain the desirable state of happiness. So, besides providing for the useful professions, the chrestomathic school sought to be an instrument of universal bliss.

The monitorial system itself was highly praised in Portugal. Several writers refer to the merits of the “Madras system” and describe how Bell and Lancaster had devised this interesting process of multiplication in the school room. The first sign of its impact on Portuguese soil appeared on the island of Madeira in 1817, barely one year after the publication of *Chrestomathia*. An English merchant, Joseph Phelps, created a society for the promotion of the scholar-teacher system, according to Lancaster’s method, and, on 1 December 1832, he opened a school for both sexes, to which 135 pupils were admitted⁸. By then, the system had already been enforced by law in Lisbon in 1824, and in 1826 it was extended to the whole country. As far as we can read in the documents of the time, the reasons for the Portuguese acclaim for Lancaster’s method were practical ones: it was not the philosophical concept behind Bentham’s proposals but the expedient means of providing a great number of teachers at short notice that attracted the praise of the Portuguese. Besides, there were some who thought that the method was congenial to the Portuguese, who had long before adopted the “happy method” of having the more advanced students teach the more backward and form among themselves the *sabatinas*, or repetition of questions and answers⁹.

Teófilo Braga, one of the Portuguese scholars belonging to a highly creative generation of writers who studied at the University of Coimbra, and who, like most of the Portuguese *intelligentsia* of the nineteenth century, deeply resented Britain’s political, military and economic power over Portugal at the time, nevertheless highly praised the advances made in the “sciences of education” all over Europe through the works of Fellenberg and Pestalozzi, and also that of the British scholars, Bell and Lancaster. Like many of his contemporaries, Braga was persuaded that Portugal could face the challenges of industrialisation only through education, that education should be open to all classes and that the State should support the education of the working classes. He also thought that the process should be conducted along secular lines and that it should follow a system, i.e. there should be a philosophy of education running from the base – general education for all – to the top – university education. At all levels, education should be concerned not with “knowledge for its own sake”, as Newman was to put it in the 1850s, but with a purpose: preparation for a profession.

Oxford and Cambridge offered degrees for the Church and a literary education for gentlemen. The University of Coimbra offered courses in Theology, Medicine, Mathematics and Law, just like most European universities at the time, but, in the nineteenth century, a majority of students followed Law. Most Portuguese writers who were critical of the University charged it with giving excessive emphasis on the study of Law and credited the backwardness of the political ruling class to the theological character of the University, seeing the power of a degree in Law as a simple instrument for achieving a sinecure and a lifetime in public service. In contradiction to this practice, the country needed engineers, chemists and all sorts of professionals in the natural and applied sciences.¹⁰

In Portugal, as in Britain, a number of institutions with a more professional and applied profile had already sprung up: schools of medical sciences, veterinary sciences, polytechnical institutions giving courses in engineering, both military and civil, accounting and many others. But

⁸ Teófilo Braga, *História da Universidade de Coimbra*, vol. IV, p. 31, and José Silvestre Ribeiro, *História dos Estabelecimentos científicos, litterarios e artisticos de Portugal nos sucessivos reinados da Monarquia*, vol. V, pp. 262-5. Silvestre Ribeiro dedicates several pages to the subject and gives the highest praise to the method and the initiative of Mr. Phelps, assisted by Mrs. Phelps.

⁹ Cândido Xavier, in *Annaes das Sciencias, das Artes e das Letras*, Paris, 1818-22, Tomo II, p. 6.

¹⁰ The University of Coimbra underwent a full reform in 1772, through which two new faculties were created, in addition to the existing faculties of Theology, Canons, Law and Medicine: a Faculty of Mathematics and a Faculty of Philosophy. This reform possessed an unquestionable modernising intention according to the interest paid by the Enlightenment to Natural Philosophy. Nevertheless, this reform was criticised by many and, in the nineteenth century, writers such as Theophilo Braga attributed to it the ‘spirit of the compendium’, i.e. the introduction of set textbooks that discouraged scientific renewal and the development of the critical mind.

these did not possess university status. The Academies, where scientific research was conducted on experimental lines, had developed in England from the foundation of the Royal Society in 1660, and Portugal could boast of two Academies, both founded in the eighteenth century, The Royal Academy of History (1720), and The Royal Academy of the Sciences (1779). But the Portuguese Academies were to cooperate closely with the University and become entangled in the political strife of the nineteenth century, thereby losing sight of their scientific purposes to some extent.¹¹

The attempt to overthrow the practices of Portuguese education took its inspiration from abroad. Many Portuguese were exiles in England and France during the civil wars of the nineteenth century and were in touch with the latest reforms and experiments in the field of education. We have already mentioned the educational theories that circulated in Portugal and were sometimes adopted by law. The experiments undertaken in Germany and the creation of the University of Berlin were welcomed as projects based on philosophical grounds, as the works of Humboldt and others stressed the need to reconcile teaching and research, and to guarantee the independence of the University from state intervention. The French initiatives, which were an outcome of the French Revolution, were also often quoted as examples of a radical reform that abolished the old Sorbonne and its ecclesiastical teaching and replaced it with various new institutions with no religious orientation, geared towards the new sciences and technologies. State intervention and centralisation did not seem to bother the Portuguese, who always relied on the State to dictate reform, particularly when the university seemed unable or unwilling to do so. The liberal English model of the university based on the college system was absent from both implicit and explicit examples of possible models for university reform in nineteenth-century Portugal.

In my view, the reason for this absence derives from the fact that Oxford and Cambridge retained their ecclesiastical and classical outlook well into the middle of the century. Oxford, in particular, remained close to the spirit that inspired the Oxford Movement in the 1830s, and Arnold could still say, in the late 1860s, "Oxford, the Oxford of the past, has many faults; and she has heavily paid for them in defeat, in isolation, in want of hold upon the modern world ... We have not won our political battles, we have not carried our main points, we have not stopped our adversaries' advance, we have not marched victoriously with the modern world" (Arnold 1971: 62). Newman, on the same side of the debate, defended an idea of a university where theology was, with philosophy and the classics, the core curriculum for the education of the gentleman, and where knowledge would be non-utilitarian and science considered a skill not requiring much intellectual power. In a conference titled "Knowledge Viewed in Relation to Professional Skill" he debated both points of view at length, opposing a utilitarian and liberal education and the university (Newman 1962: 114-135)¹². Coleridge had already denounced the initiatives of the Benthamites as the symptoms of a disease that threatened to kill the culture of the country (Coleridge 1972: 53). John Stuart Mill, who was emphatically critical of the Universities of Oxford and Cambridge, nevertheless recommended that Ancient Literature form the main part of a university curriculum, together with History, Logic and Philosophy of the Mind. He referred briefly to the natural and applied sciences as "all those sciences, in which great and certain results are arrived at by mental processes of some length and nicety ... sciences of mere ratiocination, as mathematics; and sciences partly of ratiocination, and partly of what is far more difficult, comprehensive observation and analysis" (Mill 1981: 102). In the latter group, he stressed only those "which relate to human nature".

The concerns about a scientific education at the university would acquire a persuasive apologist in T. H. Huxley, who criticised the Newman/Arnold concept of liberal education, and called the Universities of Oxford and Cambridge simply "boarding schools for bigger boys" (Huxley 1971: 93). From the 1860s onwards, many more thinkers and politicians sided with Huxley, and the universities began to make major changes in their curricula. New universities were created, often by

¹¹ Veríssimo Serrão quotes the purpose of the Royal Academy of the Sciences as being "for the advancement of National Instruction, the perfecting of the Sciences and the Arts and the furtherance of popular Industry". He says, furthermore, that both Academies received the valuable cooperation of the University of Coimbra in the parallel work that they developed in favour of the national culture. In *História das Universidades*, p. 123.

¹² Newman's discourse has, as its background, the attacks made by the *Edinburgh Review* on the University of Oxford and the responses made by Copleston and others, as mentioned above.

granting university status to colleges, as at Manchester in 1877, Sheffield (1897), Birmingham (1900) and Liverpool (1904).

In Portugal, by 1823, the idea that education deserved a comprehensive reform from primary school to the university had already been stated by Mousinho de Albuquerque in a work entitled *Ideas about the Establishment of Public Instruction*. According to the author, education should proceed from the level of primary schools for both sexes in each parish, to secondary schools in each district, to Lyceums in each provincial capital and to Academies, in the cities of Oporto, Coimbra and Lisbon, each with five full faculties: Exact Sciences, Natural Sciences, Medicine, Law, and Letters. This project was not followed until ten years later, in 1833, when a Royal Commission was appointed to design a new and comprehensive reform. The Secretary of the Commission, Almeida Garrett, propounded the most advanced ideas about education and instruction that circulated in Europe and conceived a “great, simple and uniform framework,” in which every aspect from the various degrees in education to the management of institutions was contemplated. Teófilo Braga commented on the project by saying that Garrett was introducing the “polytechnical spirit” into Portugal. In fact, he devised a reform of the University, and the creation of Polytechnical Academies, both military and civil, the School of Civil Building and Engineering, and a number of Institutes annexed to the Faculties of Mathematics and Natural Philosophy, as well as new provisions for the study of the Arts. The Polytechnical Academies were to complement the Faculties of Mathematics and Philosophy, thereby giving them “a purpose, a social application they did not possess until now, appearing more like institutions of academic luxury than professional establishments of public utility.” (cf. Braga 1892-1902: 109).

Impressed by the reforms he had witnessed in France, Guilherme Dias Pegado, a professor of Mathematics at the University of Coimbra, devised a scheme for the reform of the University on French lines, and advised the transformation of Coimbra into the “University of Portugal”, concentrating all schools and faculties in one single national project. Both thinkers were already concerned with the space allowed for Portuguese and contemporary literature at the university and advanced the idea of the creation of a Faculty of Letters, which only came into being in 1860¹³. In 1836, another Mathematics professor from the Royal Naval Academy, Albino de Figueiredo e Almeida, published a *Project for the Reform of Public Instruction*, in which he defended the idea that education should comprise the complete circle of science, i.e. theory, practice and application¹⁴. The project contemplated the creation of a university in Lisbon, where the “sciences, the arts and the letters” would be taught. The author was influenced by the Course of Positive Philosophy started by Auguste Comte in 1826, and who, from 1829 to 1836, had proceeded to systematise the entire order of knowledge, a process which preceded the birth of the discipline of Sociology. The idea of transferring the University from Coimbra to Lisbon highlighted the concern for a centre for higher education to be situated in a larger city, which would serve to stimulate activities.

In the 1830s, the conflict between the University and the proponents of a secular and technical education was in full swing. The secretary of state Rodrigo da Fonseca Magalhães had presented the government with a proposal to create an Institute for the Physical and Mathematical Sciences. The project consisted in uniting the schools and institutes of higher education involved in the fields of the natural and applied sciences, management, civil and military engineering, draughtsmanship and other subjects, into one single institution for higher learning which would further be equipped with laboratories for physics and chemistry, a botanical garden and an astronomical observatory. The opposition of the University, with great influence over the new cabinet, succeeded in aborting the project nine days after it had been approved.¹⁵

The University of Coimbra showed the most emphatic rejection of the prospective Institute. But, instead of trying to reorganise its courses of studies according to the new developments in the sciences, it fought to retain its privileges. One of the Rectors of the University, Villa Maior, wrote at length about these years and confess that the state of the university in 1835 was so discouraging that

¹³ Guilherme Dias Pegado, *Organização Geral da Universidade de Portugal*, Coimbra, 1935 (in 4º, xxxi pp. “report”, plus 48 pp. “regulations”).

¹⁴ Albino Figueiredo e Almeida, *Projecto de reforma da Instrução publica*, 1836, in 8º, lxxii, 84 pp.

¹⁵ The arguments presented by the University are fully rendered in Silvestre Ribeiro, op. cit., vol. 9, pp. 103-9.

those who despaired that it would ever regenerate itself and who recognised the need to create institutions for higher education in the sciences found it expedient to propose its transfer to the capital¹⁶. He further writes that these ideas began to awaken an ill-disguised envy amongst the body of Professors at Coimbra, who were afraid that the competition from new schools might endanger the supremacy of their university. As a result, the ensuing reforms were limited to the improvement of scientific institutions in Lisbon and Oporto, without touching the university. The failure to achieve a comprehensive law to reform the University was greeted in Coimbra with uproarious demonstrations of satisfaction. Villa Maior nevertheless stresses that the campaign of the “conservative professors of Coimbra” against the “promoters and defenders of the Institute in Lisbon” was badly managed, highly passionate, ill-timed and exceedingly unfortunate. In his opinion, the university had nothing to fear from the new Institute, since the “professional learning at the university is of a different kind, and for different purposes ...and the competition should, anyway, be of advantage because it excites the desire for improvement.” His criticism is best summarised in this sentence: “To prevent the creation of a centre of useful and necessary education is always a crime”.¹⁷

Alexandre Herculano, another important essayist, historian and novelist of the nineteenth century, deplored the triumph of the university, and said that the tombstone had fallen upon physics, chemistry, mathematics, astronomy, and that on it sat rejuvenated the old disciplines and old methods.

“The question of the Polytechnical School summarises and represents the immense question of the system of national education which was, and which will be: the question between the education and improvement of the agriculturists, the artisans, the industrialists on the one hand, and the propagation of the lawyers, casuists and prigs on the other; the question between work and idleness; the question between the farmyard and the cathedral choir; between the printer’s blade and the metaphor of the sermon; between the steam engine and the prattle of the boaster.”

The project of the Polytechnical School was revived by the Society of the Friends of the Letters (Associação dos Amigos das Letras), which in 1836 published a small volume called *The Question of the Reform of Higher Education in Portugal*, in which a full reorganisation of the university was contemplated and universities or faculties were to be created in Lisbon and Oporto, thereby making several of the schools in Coimbra redundant. For instance, theology should be taught by the Church in seminaries and not at the university; the Faculties of Canon Law and Law should be united in a single school, to remain in Coimbra until such time as state funds allowed for the creation of two Faculties of Law, one in Lisbon and the other in Oporto, where a four-year degree course in Law would be taught. The Medical Schools in Lisbon and Oporto should be improved and allowed to give degrees in Medicine, Surgery, Obstetrics and Pharmacy, thereby making the School of Medicine in Coimbra redundant. And then a new Institute for the Physical and Mathematical Sciences should be created, where Management and Engineering would be taught, as well as the core scientific disciplines in Mathematics and Philosophy, leading to the award of doctoral degrees in the Sciences. This institution would make the Faculties of Mathematics and Philosophy redundant.

In 1837, the Polytechnical School was at last created through the efforts of the Minister of War, Sá da Bandeira, and the University of Coimbra was reformed in 1836. But the reform of the University attracted the usual criticism: for some it went too far; for others, not far enough. The Faculties of Theology and Law were highly critical, but the Faculties of Medicine, Philosophy and Mathematics welcomed a reform that showed concern with the improvement of the natural sciences.¹⁸

¹⁶ Visconde de Villa Maior, in *Instituto. Revista científica e litteraria*, Coimbra, vol. XLIV, p. 396, *apud* Teófilo Braga, op. cit., pp. 123-4.

¹⁷ Teófilo Braga treats this question at length. See pp. 122 ff.

¹⁸ For a detailed appreciation of the changes made in the organisation of the Faculties and the syllabuses of all the courses, see Silvestre Ribeiro, op. cit., vol. 9, pp. 124-31.

In 1844, another reform was to follow which would reinforce the power and influence of the University over every other institution for education: a Supreme Council, operating as a kind of Ministry of Education, was constituted. Its president was the minister of the realm and its vice-president the Rector of the University; the other members were university professors. This close association between the Government and the University, based on the French centralising model, aimed at creating a co-ordinating centre for the entire cycle of education. But many viewed it as “anti-liberal”, “anti-political” and “anti-scientific” (in Silvestre Ribeiro, vol. 9: 197), operating as “the eye of the government, and its main agent, upon all things relating to education” (id.: 217). For these critics, it was a “true calamity for education in Portugal; the professors in the Council promoted the fetishism of the University, and approved inept textbooks which atrophied entire generations, since these textbooks were the only objects of examination all over the country and were slavishly learnt by heart in order to satisfy bovine examiners” (Braga 1892-1902: 158).

As the sole authority upon all things concerning education, which also meant having authority over itself, the university tended to stay put and resist change. In 1858, the Supreme Council presented a report stating that, except for primary education, education in Portugal did not need extraordinary reform measures, and that, under the august protection of the King, and in full obedience to the laws of the country, it would progress with splendour and public profit (in Braga 1892-1902: 161). Yet, the opinion of foreigners travelling through Coimbra at the time registered the medieval outlook of the students, the professors, and of the University in general: “who would believe that there still exists in Europe a place where the students dress like Doctor Faustus and Paracelsus, speak Latin, call themselves the sons of the Muses and play the guitar in the moonlight under the windows of their beloved?” Or another impression from 1878, based on the photographs sent by the University to the International Exhibition in Paris: “here is the Doctor, red hood and black cap, wide eyed, jolly-faced ... he is truly the mediaeval Doctor ... As a frame to this picture, add those figures, much more of that time than of ours, of the beadle and the halberdier” (id: 161-2 n).

Coimbra looked anachronistic to most contemporaries. The fact that all institutions of higher education in the country were controlled through the university led to a comparative ineffectivity in the Polytechnical Schools – their “denaturation”, according to Braga – that is, their inclination towards theoretical courses, following the decline of their more practical purposes. In 1852, the government created a new Ministry of Public Works and, by decree, this Ministry created the Industrial Institute of Lisbon and the Industrial School of Oporto, as well as the General Institute of Agriculture. Many reforms and the foundation of new schools dedicated to useful learning were to follow until the end of the century. But the political turmoil into which the country had been plunged prevented the completion of these projects and many never saw the light of day, even after legal ratification. This was the case with the provincial schools of technology founded in Guimarães, Covilhã and Portalegre. Others were truncated through a lack of funding and yet others were corrupted by the theoretical bias of the teaching.

Yet another important development in higher education in Portugal was to take place at the end of the 1850s: the project for a Faculty of Philosophy and Letters in Lisbon. The young King, Dom Pedro V, was the main architect of what was created in 1860 as the “Curso Superior de Letras”. The scientific background to the institution was the “linking of philosophy with philology”; both disciplines of thought would impregnate and fertilise each other, joining scholarship and synthesis in a way which should lead to the correction of the mean spirit of specialisation that affected the harmony of modern consciousness” (Braga 1892-1902: 198). The document in which the King recommended the creation of the new institution for higher education is in itself a manifesto regarding the state of education in Portugal. Dom Pedro saw the new institution as a “principle of reform for Higher Education” through the study of literature, ancient and modern, and the study of history. And he located the institution in Lisbon, because “the schools are situated where they best can recruit their staff and best may serve the intellectual development of the people” (id: 201). The new institution served no utilitarian purpose. It did not prepare for a profession and could remain completely independent from the pressures that the University of Coimbra suffered when it released into the world batches of law graduates who saw their bachelor’s degree merely as an instrument for promotion in public office.

The latest developments in philosophy, philology and history in Europe defined the early programmes of the Course. The King wanted the faculty to be experimental in the sciences of language and society and he himself would attend the first lectures that were given. Unfortunately, Dom Pedro died at the age of 24, barely eleven months after the formal opening of the institution. Afterwards, it began to acquire some of the characteristics of a teacher training college for secondary education and its more creative purposes were impaired.

According to the most creative writers of the late nineteenth century, education in Portugal suffered from a deficit of pedagogical thought, from the absence of a system of education and from a very defective systematisation of the sciences. For the Portuguese *intelligentsia*, the university in particular lacked subjection to any philosophical principle in its ordering of the sciences. The works of Auguste Comte, T. H. Huxley and Herbert Spencer provided the scientific basis on which Teófilo Braga founded his "Integral System of Public Instruction" (Braga 1892-1902: 232-7), in which he expressed his ideas about the ordering of the sciences and their correspondence into institutions dedicated to research and teaching. But such projects were not put into practice. The various degrees in education remained comparatively isolated from one another and the University of Coimbra was to retain its status as the only university in Portugal until the end of the monarchy and the beginning of the republic in 1910-11. In spite of the fact that the Faculty of Philosophy had, since 1844, included the study of sciences such as Physics, Chemistry, Zoology, Botany, and also Mineralogy, Geology, Mining, Agriculture, Rural Economy and Veterinary Science, the university retained its theoretical bent. Furthermore, the new disciplines seemed to be included without any real care for their content and sequence in the syllabus, more like a half-hearted concession to the pressures of the time than a true revision of content and methods.

Education for the professions, on the other hand, was the subject of a considerable number of initiatives, although "polytechnical" education remained in an uncertain position with regard to its academic status.

Apart from the repeated complaint that there was not a full and satisfactory philosophical system for the ordering of academic disciplines in the Portuguese institutions of higher learning, we can perceive another line of thought which is of interest: the dependence of education upon state funding and state decisions. From the above, we can see, time and again, that the various processes of reform in the nineteenth century were all dependent upon state legislation and that the upheavals in government and cabinet decided which institutions were created and which were suppressed, as well as which disciplines and chairs. Even the University, in spite of enjoying great financial autonomy at the beginning of the century, gradually lost some privileges and was, as we saw, forced by the government to introduce some reforms. This dependence on the government represented, for many, a grievous limitation of the liberal spirit that was meant to shape higher education.

The conflict between "knowledge as its own end" and vocational education took on different shapes in England and in Portugal, but in both countries it was perhaps the main bone of contention in the debate about higher education that took place during the nineteenth century. As the need for specialisation grew, as new sciences struggled for recognition as independent disciplines at the University, literary and scientific education was unable to find a middle way where both points of view could be balanced. In the late 1950s, C. P. Snow denounced "the two cultures" as a major impoverishment in the general culture of the century. Fifty years later, the debate is still open.

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