The expansion of higher education in England

Lowe, Roy

Veröffentlichungsversion / Published Version
Sammelwerksbeitrag / collection article

Part One: The Dynamics of Expansion

Roy Lowe

The Expansion of Higher Education in England

The late nineteenth and early twentieth centuries saw a phenomenal and unprecedented growth in the provision of higher education in England. At the commencement of the period, in mid-century, there were but four small university institutions and a number of provincial colleges of varying prestige and clientele. For the vast bulk of the population education beyond elementary school had to be sought through Mechanic's Institutes or Adult Schools. Within eighty years this situation had been completely transformed through a process of growth and systematization. By 1930 the different elements in what could be discerned as a system stood in a clear relationship one to another, and identified themselves with particular social groups. Similarities with higher education in other major industrial societies were now more manifest: admission qualifications and ages were, by 1930, largely standardized; specialist faculties, each linking with professional occupations, had been established, and, more importantly, a definite hierarchy of educational institutions was discernible. How did this process occur in England between 1860 and 1930?

The Determinants of Expansion:

During these years higher education in England responded to a series of changes in the economic and commercial structure which impinged on all major industrial societies. The onset of what Fritz Ringer has called the "high industrial" phase of development involved the deployment of a far more highly skilled labor force than had previously been required as well as the swift expansion of ancillary professional services such as banking and accountancy. The first phase of British industrialization, centered largely on innovation and growth in the textile industries, was giving way to, and had helped to initiate, a second based to a greater degree on the development of coal and iron resources and the building of railways. In the seventy years after 1860 whole new industries emerged (machine tool, chemical, and electrical), with Britain becoming increasingly an industrial exporter, involved in heavy investment abroad. This growth in scale of both industrial and urban systems meant not only the rise of manufacturing regions but also more sophisticated transportation networks. Fueled by late-nineteenth century imperialism and by sharpened rivalry between nations,

these changes both depended upon and, in turn, stimulated the transformation of higher education.

Two consequences were immediately apparent. On the one hand there was a sustained and growing demand for vocational training. The number of workers in engineering, the machine tool industry and shipbuilding doubled between 1851 and 1881. Despite some employers' concern that technical education might lead to the dissemination of trade secrets, these new industries necessarily increased the demand for skilled and semi-skilled workers. The second outcome was a growing sensitivity to foreign developments. This intensified competition involved a new interest in how industrial rivals trained their work force. In 1881 the Samuelson Commission was ordered to "inquire into the instruction of the industrial classes in certain foreign countries in technical and other subjects and into the influence of such instruction on manufacturing and other industries at home and abroad."

Ironically, English contemporaries did not always perceive the need for change. Often the attention of those involved in the debate on higher education concentrated upon the need to preserve significant elements of the existing system in the face of sweeping changes. The rhetoric of the day emphasized the maintenance of traditional styles as much as the necessity to adapt to new circumstances. The way in which contemporary needs were perceived was to prove critical in shaping this emerging system.

Some developments appeared irresistible. This was certainly true of one of the most significant elements in the process of growth, the enhanced demand from below. The Schools Enquiry Commissioners estimated the number in receipt of grammar school education in 1861 as nearly 37,000. By 1931 there were a total of 433,517 children in recognized secondary schools. This growth was swiftest after 1902, when the newly formed Local Education Authorities assumed responsibility for secondary education. They participated in the virtual creation of a system of girls' secondary education. The implications for higher education were immediately perceived. As early as 1870, John Percival, headmaster of Clifton College, used the annual gathering of the National Association for the Promotion of Social Science to urge the Universities to recognize

> a whole class of schools which have sprung up in obedience to a national want.... Who can fail to lament the want of real living connection between our old universities and the great commercial and industrial centers? A great step will have been taken in this direction if the universities so reform themselves as to remain closely connected with the middle class schools, even those of modern aims and tendencies.[1]

Those involved in the debate on secondary education, which was itself rapidly expanding, demanded university reform in these terms.

As the industrial towns grew, and municipal politics became linked with civic pride, a more general critique of the isolation of the universities appeared. It was realized that local colleges, dispersed throughout the industrial north, could provide a cultural focus. Joseph Chamberlain emphasized this point in his frequently quoted 1898 pronouncement:

1. *Transactions of the National Association for the Promotion of Social Science,* 1870, 311–6.

To place a university in the middle of a great industrial and manufacturing population is to do something to leaven the whole mass with higher aims and higher intellectual ambitions than would otherwise be possible to people engaged entirely in trading and commercial pursuits.[2]

Equally, as Arthur Smithells, the Professor of Chemistry at the newly chartered Leeds University, spelled out, the time was ripe for the universities to replace their monastic ideal by a closer identity with these growing towns:

English education and English life have suffered to an almost incalculable extent by the isolation of our ancient universities. The want of geographical contact between the greatest seats of learning and the busy hives of industry ... have been attended by mutual disadvantages, and ... have placed in actual opposition two spheres of human activity that, in a well-regulated world, should be coincident.[3]

This was supplemented by the observation that, since the century had witnessed a shift of population to the northern towns, new foundations were needed to obviate the expense of living away from home.[4]

Although industrial development, a revitalized secondary school system and urbanization may be readily identified as three major factors influencing the development of higher education, there was never any identifiable consensus on the kinds of growth which would best meet the national need. However, in the ferment of ideas which were canvassed, some dominant arguments did recur.

Within Oxbridge, despite the reforms of the 1850s and 1870s, which had set fair to modernize those institutions, there was little readiness for sweeping change. The unpreparedness for innovation was well summarized by Edwin Guest, Master of Gonville and Caius, who, in 1870, proffered one of the more congenial responses to the relentless prodding of the Devonshire Commissioners:

Where there are so many conflicting interests to reconcile, it is obvious that prudence is necessary.... Precipitate action might do more harm than good. It would be, indeed, a sad thing if, in becoming "Physicists", we were to put into jeopardy the character of our University as the great mathematical school of Europe.[5]

That character involved adherence to the ideal of a liberal rather than a vocationally-oriented curriculum, and to a collegiate system fulfilling a strong pastoral role. For many dons, abandonment of these aims was too great a price to pay for the modernization of the two major universities.

But if Oxford and Cambridge were slow to initiate internal reform, one increasingly acceptable growth outlet, which reaffirmed the national function of the universities, was the nascent extension movement. This development, initiated by James Stuart in the early 1870s at Cambridge, with Oxford following just a few years later, arose from what one contemporary called "a widespread opinion in favor of a diversification of their revenues for the promotion of higher education in the great centers of population."[6] Increasingly, this movement, as it hardened into the Tutorial Class-

2. W. H. G. Armytage, *Civic Universities* (London, 1955), 243.
3. *University Review*, 21, No. 4 (January, 1907), 146.
4. M. Sanderson, *The Universities and British Industry, 1850-1970* (London, 1972), 3.
5. Evidence given on 30 June, 1870; see *Scientific Instruction*, H.M.S.O. (London, 1870), 3: 217-8.
6. *University Extension Journal*, 3 (October 1898), 27.

work of the early Twentieth Century, was viewed by critics as an attempt to mould a refractory and dangerous proletariat in the image of "the reasonable university man."[7] For its enthusiasts, men like Mansbridge and Tawney, this was seen in the years before the First World War as a device which might offer a broad "highway" to a democratized system of higher education, rather than the selective ladder established in the wake of the 1902 Education Act. It succeeded in bringing thousands into contact with university work, and in disseminating the ideal of a liberal education among the nation at large. It is no coincidence that those of the new university colleges which grew from local extension centers—notably Nottingham and Reading—subscribed more readily at the outset to a curriculum balanced between Arts and Sciences, and did not set about an immediate radical reconsideration of the ideal of a university.

At London, too, the introduction of external degrees in 1858 and the recognition of women students in 1878 provided the framework by which the university sponsored growth in other leading towns, although both concessions were made in response to the internal problems of the London colleges rather than with an eye to growth at the national level. Similarly, at Durham, close ties with the established church retarded innovation, a fact which elicited the scorn of Lyon Playfair in 1868:

> Though it does teach engineering just now, and does pay a nominal attention to science, it was so difficult, a few years ago, to get them to comprehend science in any enlarged aspect that I have not much hope of Durham. That university had a splendid opportunity of becoming a people's university for the great manufacturing counties in the north of England; but, being governed chiefly by clerical authorities, who naturally looked chiefly to the traditions of Oxford and Cambridge, the university has not taken root in the affections and sympathies of the population around it.[8]

For the subsequent structure of higher education in England this failure of the existing universities to commit themselves wholeheartedly to expansion was critical. The outcome was a whole series of new institutions aiming at a different clientele, and standing below Oxbridge and the London colleges in prestige. Further, the pre-existing universities compounded this contrast by ensuring that in those activities which did impinge upon the wider public—university extension and examining—the pattern was largely of evening teaching. Thus the precedent of a growth in "compensatory" higher educational agencies, soaking up demand which could not be met within the existing systems, was laid down at the beginning of the period under review.

In the major industrial cities the need for growth in higher education was readily perceived and forcefully articulated. The civic colleges represented a direct attack upon the concept of a university as a monastic institution offering a humane education in the liberal arts. Ironically, it was an Oxford scholar, J. R. Seeley, who most cogently spelled out the nature of the development foreseen, when, in 1887, he joined the debate on a Midland university:

---

7. S. Rowbotham, "The call to University Extension teaching", *University of Birmingham Historical Journal,* 12, No. 1 (1969), 71.
8. *Scientific Instruction,* 1 (1868), 59.

It is desirable greatly to increase the number and to disperse over the country teachers of the particular type which is produced at the universities ... who have their knowledge at first hand, speak with authority each in his department, and speak to men. ... England, which till lately has had but two universities, will have a dozen.[9]

For Seeley, these new institutions should not be collegiate, on the Oxford model, nor must they dissipate themselves in examining. In sum their brief was to be the democratization of the knowledge of the age:

Modern civilization needs a vast quantity of science: the demand for trustworthy knowledge, scientific, sanitary, technical, economical, political, historical, moral and religious, rises with urgency from these great towns. Why should it not be met by universities founded everywhere?[10]

The debate on the founding of a Midland university, in which Seeley was joined by the professoriate of Mason College, Birmingham, elucidated most of the major strands of the argument on the kind of growth that was foreseen. In 1892, B. C. A. Windle, the Professor of Anatomy, emphasized the extent to which local needs should be met:

Every new university should be not merely the expression of a local desire for the best form of education, but should also be informed by the spirit and influenced by the peculiar nature of the pursuits of the district in which it is located ... we should not hesitate to strike out on new lines.[11]

E. A. Sonnenschein, the Professor of Classics, attempted to resuscitate the collegiate ideal with a proposal for a federated university with sister colleges at Nottingham, Bristol and Birmingham. His reasoning followed that which had led to the establishment of a federated Victoria University in the major northern cities a decade earlier.[12]

The real impetus to a full-blown attack on the existing university ideal stemmed from the exploration of foreign precedents. Seeley had suggested in 1887 that Heidelberg and Edinburgh both proffered valuable models of successful non-collegiate institutions. The Birmingham syndics dispatched in 1898 a three-man delegation to study Canadian and American practice. It was under their influence that W. J. Ashley was recruited from Toronto to lead the infant Faculty of Commerce at Birmingham. He immediately became the apologist for radical departures:

Birmingham does not dream of rivalling the two older universities in the studies particularly associated with them, like Classics, Maths., Philosophy and History. It will give its energies, and turn its resources, towards those fields in which they do little, and in which the loss of the amenities of college life is counterbalanced by the advantages derived from a position in the midst of a great industrial population ... accordingly our curriculum will be very elastic.[13]

---

9. J. R. Seeley, *A Midland University* (Birmingham, 1887), 13–14.
10. Seeley, 13–14.
11. E. W. Vincent and P. Hinton, *The University of Birmingham* (Birmingham, 1947), 6.
12. Vincent and Hinton, 6.
13. W. J. Ashley, "The Universities and Commercial Education", *North American Review*, 15 (January 1903), 17.

Contentiously, Ashley went on to claim technical studies as the prerogative of the universities, citing Leipzig as the welcome exception among German universities in which commercial education was pursued at the highest level.

Similar arguments were adduced for the other civic colleges. At Leeds, local industrialists demanded a professoriate who would be "a general source of scientific enlightenment to the county."[14] Significantly, the Yorkshire College began work with no teaching in the Arts. It was only introduced under the influence of Cambridge Extension lecturers, and the first Professors in the Humanities were paid on a lower scale than their scientific brethren. At Liverpool, Ramsay Muir repeatedly emphasized that his college would offer the best vocational training: "A university is the only possible vitalising force for technical education which aims at developing capacity for a particular profession."[15] The protagonists of the new university colleges predicted a swift growth in the provision of technical and scientific places, although this was rarely, if ever, quantified.

There were significant addenda to the case for growth. One was the argument that more places must be made available for young women. Typical was Arthur Smithells, Professor of Chemistry at Leeds, who, inaugurating a course on Home Science at Kings College, London, in 1908, pleaded the feminist cause:

> We shall find plenty of young women of talent who have the inclination and the opportunity to devote a few years to this kind of higher education and who will return from it ready to enter with redoubled interest and usefulness into the realm of home life.[16]

A further reason, advanced initially in 1907 by Ramsay Muir, was that the university needed to be enlarged and democratised to ensure a supply of entrants to teaching. He pointed out that "this movement had enormously reduced the cost of university education, and brought it visibly within the reach of thousands to whom it had been unattainable. Hence has come a remarkable increase in the 'natural supply' of teachers, adequately trained at their own expense."[17] To further this process, he argued, the inadequate courses currently offered in the university day training departments should be replaced by one-year professional training following on a three-year undergraduate course. Four years later this scheme was formally adopted.

Meanwhile, the case for an expansion of vocational and technical training outside the universities was also being made. By 1870 the proselytising of Lyon Playfair and his associates had led to a Select Committee and a scheme for a National Technical University. Working through the Science and Art Department, and, after 1887 the National Association for the Promotion of Technical Education, this lobby argued consistently for governmental backing for new initiatives. The outcome was not only the first steps (from 1889) to fund the new university colleges, but also the appearance of separate institutions, financed in part by the Science and Art Department and in part from local rates, devoted to technical education. The City and Guilds College, 1881, and the Regent Street Polytechnic, acquired by Quintin Hogg in the same year, were crucial precedents, establishing the model of technical institutes out-

14. A. N. Shimmin, *The University of Leeds* (Cambridge, 1954), 10.
15. Shimmin, 25.
16. *University Review*, 40 (1909), 246.
17. *University Review*, 22 (1907), 349.

side and below the university sector. In response to the accusation that he had neglected cultural studies, Hogg replied: "I did not include the subjects you mentioned for fear of attracting a class of young men of a higher education status than those for whom the institute was intended."[18] Against this background, the rift between the university and non-university sectors hardened, so that by 1910 the Commission on University Education in London was able to report: "Universities are institutions for making officers; the polytechnics were intended to be institutions to make the rank and file the most capable rank and file in the world."[19]

Throughout this period the evening school movement gained force. In a strong plea for technical education in evening schools in 1905 C. H. Creasey emphasized that "one of the most pressing educational needs of the next few years, is to adapt instruction to the capacity of a larger number of earnest students."[20] Similarly, in the *University Review* four years later, W. J. Bees, a schools' inspector, argued for a vast increase in technical education if British industry was to match that of Germany, where a quarter of the work force had received a technical training:

> Higher education for the great mass of people in industrial districts must be evening education ... a steady flow of evening students should pass from the advanced technical institutions to the university. This will enable the university to fulfill its function as the head of the evening school scheme in great industrial and commercial districts.[21]

In these terms the locally financed Technical Colleges and Evening Schools, which together constituted the fastest growing sector of English higher education, were condemned to inferior status.

The Pattern of Growth:

How did these new demands relate to the pattern of actual developments between 1860 and 1930? Any statistical treatment is open to the charge that figures presented at the time were often not accurately researched or contained their own internal inconsistencies. But with the introduction of annual returns from university colleges in 1893 and the centralization of records through the Board of Education after 1899, these problems decreased during the later part of the period under review.[22]

---

18. S. F. Cotgrove, *Technical Education and Social Change* (London, 1958), 63.
19. Cotgrove, 64.
20. C. H. Creasey, *Technical Education in Evening Schools* (London, 1905), 5.
21. *University Review*, 43 (1909), 498.
22. The statistics presented are drawn from a variety of sources, most notably:
    Annual Reports of the Committee of Council on Education,
    Science and Art Department Annual Reports,
    Board of Education: *Annual Reports,*
    Statistics of Public Education,
    Lists of Schools,
    Reports from University Colleges (Annual, 1893–1920),
    Returns from Universities and University Colleges, in receipt of grant (Annual, 1920–31),
    Cambridge Historical Register,
    Oxford Historical Register,
    Royal Commissions on Oxford and Cambridge (1874, 1922),

Throughout these figures census years have been used to provide a sample which is readily comparable with overall population trends. However this technique runs the risk of distortion through the particular circumstances of individual years: for example, 1921 saw the zenith of the brief post-war economic expansion and an abnormally high demand for educational facilities from newly demobilized troops. Nonetheless, over the long run these decennial returns are a sufficiently reliable guide to the overall growth of the English system.

Broadly, the pattern which emerges confirms that pre-existing university institutions were slow to respond to changed circumstances. Consequently much work developed in relatively new institutional forms unhampered by a traditional role and readier to adjust to the demands of expansion. Because of contemporary ambiguity over precisely what constituted higher education, it was necessary to review the whole post-school provision, including work which was often of low status, but which catered to those social groups unable to aspire to a university education for historical reasons. In a country with clearly defined class boundaries, where the existing universities remained the preserve of the privileged, the shift towards a schooled society, far more of whose members aspired to higher education, took place through new "compensatory" institutions which, for reasons associated with class exclusivity, were not immediately granted recognition as institutions of higher learning. This eclectic approach is further justified, because, as part of the gradual professionalization of society, the artisans and skilled workers who looked to the adult movement or to technical classes for their own education, were themselves, in turn, to father the first-generation university entrants of the mid-twentieth century.

Even for the pre-existing universities of Cambridge, Oxford, London and Durham (Table 1) it is impossible to be entirely confident of student numbers, although these figures, researched independently, are sufficiently close to those put forward by Stone for Oxbridge to indicate that both are fairly near the mark.[23] They suggest an eight-fold growth in this sector during the whole period, with the greatest expansion occurring in the newer institutions. Thus, the figures lend credence to the view that Oxbridge was far from wholehearted in accommodating to change.

Within the new provincial university colleges (Table 2) growth was even more startling. In each case returns are shown for the original foundation from which the later university developed. Where estimates have been made, they are based on individual college histories and the best available secondary sources. Although, even by 1931, none of these universities could compare in size with Oxford, Cambridge or London, in total they constituted a new sector of higher education, with a maximum student capacity, towards the end of the period, nearly thirty times as great as that at the outset.

University Yearbook,

Census Reports, 1861–1931,

M. Greenwood, "University Education", *Journal of the Royal Statistical Society,* 48 (1935), 241.

Where these sources failed to provide information, resort was made to works on individual colleges, cf. H. Silver and S. J. Teague, *The History of British Universities, 1800–1969: A Bibliography* (London, 1971).

23. L. Stone (ed.), *The University in Society* (Oxford, 1975), 1: 91–2.

Table 1: Full Time Students in Pre-Existing Universities

	CAMBRIDGE	OXFORD	LONDON	DURHAM	TOTAL
1861	1,200*	1,200*	375*	50*	2,825
1871	1,750	1,940	300	70*	4,060
1881	2,400*	2,310	700	300*	5,610
1891	2,700*	2,400*	1,100*	350*	6,550
1901	3,080	2,800	900*	250*	7,030
1911	3,970	3,400	4,120	900*	12,390
1921	5,900	4,440	6,950	1,200*	18,490
1931	5,600	4,572	10,281	1,446	21,899

*Approximation based on returns of graduates for one year only.

Table 2: New University Foundations

Total Numbers of Enrolled Students

	1861	1871	1881	1891	1901	1911	1921	1931
Birmingham			200	650*	749	1,017	1,923	1,630
Bristol			350*	450*	542	834	1,045	954
Exeter				100*	200*	300*	450	650
Hull								100
Leeds			463	973	958	1,168	2,334	1,884
Leicester							9	100*
Liverpool				1,290*	974	1,401	2,665	2,220
Manchester	500*	1,000	1,100	1,300*	1,194	1,660	2,397	2,477
Newcastle	60	200	350	1,900*	1,612	1,435	1,628	1,411
Nottingham			1,600	1,600	1,914	1,906	1,075	1,551
Reading					500*	1,083	563	641
Sheffield			400	500	1,266	2,500	1,072	965
Southampton		270	500*	700*	900*	738	940	772
TOTAL	560	1,470	4,963	9,463	10,809	14,042	16,101	15,355

*Estimate

Perhaps the most significant change concealed by these global figures is the decline of part-time teaching in these institutions (Table 3). At their outset several of these colleges proliferated evening and day-release courses, most aimed at young

Table 3: Ratio of Full-Time to Part-Time Students in Provincial University Colleges

		1893	1901	1911	1921	1931
Birmingham	FT	409	435	868	1,809	1,446
	PT	291	314	149	114	184
Bristol	FT	412	334	467	1,008	905
	PT	293	208	357	37	49
Leeds	FT	400	746	660	1,610	1,510
	PT	501	212	503	724	374
Liverpool	FT	517	683	919	2,314	1,747
	PT	776	291	482	351	473
Manchester	FT	987	1,048	1,374	2,006	2,107
	PT	320	146	286	391	373
Newcastle	FT	482	502	652	1,212	1,058
	PT	1,478	1,110	783	416	353
Nottingham	FT	431	446	242	776	644
	PT	1,329	1,696	1,664	299	907
Sheffield	FT	158	361	354	947	749
	PT	103	905	2,164	125	216
Reading	FT			335	549	626
	PT			748	14	15
Southampton	FT			204	343	474
	PT			534	597	298

Table 4: Ratios of Female Students in Provincial University Colleges

	1893		1901		1911		1921		1931	
	M	F	M	F	M	F	M	F	M	F
Birmingham	365	335	368	381			1,354	455	985	461
Bristol	387	318	345	197			681	327	572	333
Leeds	354	46	428	139			1,288	322	1,131	379
Liverpool	447	120	559	124			1,766	548	1,203	544
Manchester	-	-	-	-			1,425	581	1,476	631
Newcastle	1,545	415	1,364	248			980	232	783	275
Nottingham	-	-	-	-			650	126	447	197
Reading	-	-	-	-			214	335	250	376
Sheffield	194	67	1,118	87			751	196	568	181
Southampton	-	-					198	145	305	169

no return presented

workers in local industries. When this function was taken on by technical colleges, and as industry increasingly demanded training through full-time courses, the pattern changed, with only those colleges which had derived originally from a strong local university extension tradition, such as Nottingham, resisting the trend until at least the First World War. The figures suggest, too, that the contraction of part-time work coincided not with the granting of full university status but with the First World War, after which no institution resumed its earlier character completely. Even Leeds, which retained large numbers of part-time students into the 1920s, eroded their part in the university by a rapid expansion of full-time capacity.

It is also interesting to consider the extent to which this growth enhanced the opportunities for women to pursue academic training (Table 4). It becomes clear that the provincial colleges were, from their inception, at least accessible to women, and, so far as one can generalize, there seems to have been little change in the ratio of men to women, despite the swift growth in overall numbers. Women remained outnumbered by three or four to one at most institutions. The two exceptions were Birmingham and Bristol, where expansion involved vastly increased numbers of male entrants while the female portion remained static in size, representing a decreasing proportion of the student body.

Another significant development in these colleges was the growing concentration upon teaching to degree level (Table 5). The first returns from the colleges show only a small minority of students proceeding to degrees. At Mason College, Birmingham in 1893, only 14 of 700 students received London external degrees. This was not untypical. In the same year 13 graduated from Bristol, 13 from Leeds, 123 from Manchester, and 17 from Nottingham. From 1911 onwards, when more systematic records are available, a majority of students were on degree courses. This concomitant of recognition as a university was part of the process by which the provincial colleges established their position in the status hierarchy. Degree courses gave access either to professional posts or to managerial positions within industry. Thus, as the period progressed, the university colleges neglected increasingly the skilled artisans whom, it had been foreseen, they might train.

But below these aspirant university colleges there was a plethora of institutions offering technical education of one sort or another. A useful index of the development of this sector is furnished by the annual returns of recognized classes and students, first to the Science and Art Department, and subsequently to the Board of Education (Table 6). The tradition of part-time study in these institutions was never seriously threatened. By 1931 only 8,000 students, from a cohort of over a million, were studying full-time in technical colleges. These were, in the main, products of elementary schools financed by either L.E.A. or industrial scholarships. The Clerk Report of 1931, which examined these colleges indicated no desire, from industrialists or educationalists, to see the English tradition of part-time technical education modified.[24] The needs of British industry were to be met by the elementary schools, with a leaving age raised to 15, or by technical secondary schools, newly sanctioned by fashionable psychological theory. Thus, technical education remained low in prestige and failed to establish clear routes to managerial positions throughout the period under

24. Clerk Report, *Education for the Engineering Industry*, H.M.S.O. (London, 1931).

Table 5: The Growth of Work at Degree Level

	1910 - 11			1920 - 21								1930 - 31							
	FULL TIME STUDENTS			FULL TIME STUDENTS								FULL TIME STUDENTS							
	Degree	Diploma	P.G.	Research		P.G.		Degree		Diploma		Research		Others		Degree		Diploma	
				M	W	M	W	M	W	M	W	M	W	M	W	M	W	M	W
Birmingham	565	242	19	42	22	1	16	1,073	244	238	173	57	17	0	0	7	3	265	155	179
Bristol	232	226	9	11	0	9	23	360	216	301	88	34	10	0	0	411		260	127	63
Leeds	409	108	18	11	6	6	10	817	287	454	19	57	16	0	0	832		242	242	121
Liverpool	679	199	37	22	0	8	28	1,198	473	538	47	36	3	0	0	844		391	323	150
Manchester	936	295	117	46	21	16	35	1,125	490	238	35	57	14	4	1	1,019		503	396	113
Newcastle	458	165	2	7	1	26	8	741	184	86	2	17	2	0	0	610		194	156	79
Nottingham	133	102	6	8	1	8	3	252	43	382	79	13	0	0	0	184		72	250	125
Reading	115	125	11	4	1	0	1	109	129	101	124	8	11	0	1	147		171	195	193
Sheffield	215	76	7	13	0	12	23	469	168	257	5	30	3	1	0	416		139	121	39
Southampton	99	103	2	3	1	1	6	98	67	96	71	2	0	0	0	146		78	157	91

Table 6: Students in Receipt of Technical Education in Recognized Classes

	Schools	Classes	Pupils under Instruction
1861	38		1,330
1871	908		38,015
1881	1360	4839	61,177
1891	2164	8568	148,408
1901			
	In day science classes		66,384
	In evening science classes		98,673
	In day art classes		52,533
	In evening art classes		67,854
		TOTAL	285,444
1911			
	In day technical institutes		3,024
	In day technical classes elsewhere		11,329
	In evening and similar schools		708,259
	In schools of art		41,292
	In art classes elsewhere		3,217
		TOTAL	767,121
1921			
	In technical schools		5,434
	In day technical-classes		15,976
	In Schools of Art		48,109
	In art classes		3,611
	In part-time technical instruction		866,567
	In part-time technical courses		781,619
	In day continuation courses		55,261
		TOTAL	1,776,568
	(The returns for 1921 are for England and Wales.)		
1931			
	In technical colleges		8,030
	In day technical classes		27,819
	In art schools		58,700
	In day continuation schools		20,656
	In evening institutions		905,786
		TOTAL	1,020,991

review. Its growth was phenomenal, but was accomplished through the extension of part-time facilities.

The third major area to be considered in any overview of higher education is that of teacher training. It provided one of the most significant pioneer routes for social

mobility, with the vast majority of entrants coming from working-class or lower-middle class origins and gaining job-security in the difficult conditions of the early twentieth century. This was, too, an area in which women preponderated, suggesting that teacher training may well have been a common outlet for able girls who could not aspire to a university education (Table 7).

The vagaries of the English system render a precise comparison with other societies, in which categories of students may be clearly delineated, difficult. In England, for example, medical education became the concern of the universities by the mid-19th century, and, for most of the period, university statistics subsume the vast majority of medical students. Legislation in 1858, which standardized admission to the Medical Register, soon led to all training taking place either in the universities or in medical schools which came under their auspices.[25] Legal training, too, became linked more usually with a university education in the late 19th century, although some census reports give returns of law students outside the universities. In 1881, for example, there were 1,600 such students, but, unfortunately, similar statistics are not available for the whole period under review. It would be reasonable to assume that the figures given here omit a significant number of trainees for professional posts who cannot be readily quantified. They also overlook the host of students in the adult education movement, Mechanics Institutes, Athenaeums and the like. Since many of these had a substantial social membership, any accurate assessment of their educational functions is difficult. There is a risk, too, that the figures presented here involve some double counting, since some training colleges were recognized as Science and Art centers with students listed in the official returns of Technical Colleges.

Despite these reservations, it is possible to attempt a rough index of the numbers in receipt of some kind of post-school education in England during the period under review (Table 8). It shows that the ten-fold growth in the numbers attending university and teacher training college was far outweighed by the growth of part-time technical education. Thus, while the right-hand column suggests that a dramatic transformation came over English society, with some kind of post-school education becoming a real possibility for many young people, it must be remembered that most of this took place in the low-prestige, part-time "compensatory" institutions whose development allowed the universities to remain above the hurly-burly of this change.

Setting these figures alongside the overall population trends for England and Wales, makes it possible to depict the student body as a percentage of the total population and of the 20–24 age group (Table 9). Thus, these years saw an increase of nearly six times in the likelihood of any individual receiving a university education, and of eighty times in access to some kind of post-school educational experience.

Finally, the statistics of growth decade by decade show the universities responding to slightly different stimuli than those influencing the technical sector (Table 10). For the universities the 1870s and 1880s were the two major growth periods, while in the technical sector the 1860s and 1880s were clearly the more significant periods. In both sectors the first decade of the century saw an upturn in growth which was not subsequently matched.

In brief, these statistics give credence to the hypothesis that in England a diverse and highly-stratified system of higher education developed partly as a consequence

25. R. M. Walker, *Medical Education in Britain* (London, 1965).

Table 7: Students Training to Teach

		No. of colleges	M	F	Total
1861	Church of England	15	905	844	1,749
	British	1			121
	Wesleyan	1			114
	Roman Catholic	3			145
	TOTAL				2,129
1871	Church of England	22	835	781	1,616
	British	3	140	203	343
	Wesleyan	2	125	105	230
	Congregational	1	22	25	47
	Home and Colonial	1	0	140	140
	Roman Catholic	2	63	88	151
	TOTALS	31	1,185	1,342	2,527
1881	Church of England	25	904	1,199	2,203
	British	3	130	200	330
	Wesleyan	2	117	109	226
	Congregational	1	23	32	55
	Roman Catholic	3	42	146	188
	TOTALS	34	1,216	1,686	3,002
1891	Church of England	26	916	1,198	2,114
	British	4	137	255	392
	Wesleyan	2	119	109	228
	Roman Catholic	3	44	186	230
	Undenominational	2	33	129	162
	TOTALS	37	1,249	1,877	3,126
1901	In training colleges	64	2,192	3,610	5,802
	Being taught part-time in pupil teacher centers	38	506	643	1,149
	TOTAL				6,951
1911	Training for elementary teaching		3,870	7,295	11,165
	Training for secondary teaching		37	145	182
	Training for domestic science teaching			910	910
	TOTAL				12,257
1921	Pupil teachers in centers		597	2,745	3,342
	Pupil teachers not in centers		159	1,710	1,869
	Student teachers		5,741	10,930	16,671
	TOTAL				21,882
1931	Pupil teachers in centers		150	198	348
	Rural pupil teachers		120	565	685
	Student teachers		6,757	12,727	19,484
	TOTAL				20,517

Table 8: Total Numbers in Receipt of Post-School Education in England

Year	Oxbridge, Durham and London	Provincial Universities	Total No. of Students in Universities and University Colleges	Technical Education	Teacher Training	Total (Nearest 100)
1861	2,825	560	3,385	1,330	2,129	6,800
1871	4,090	1,470	5,560	38,015	2,527	46,100
1881	5,610	4,950	10,560	61,177	3,002	74,700
1891	6,550	9,463	16,013	148,408	3,126	167,500
1901	7,030	10,809	17,839	285,444	6,951	310,200
1911	12,390	14,042	26,414	767,121	12,257	805,800
1921	18,490	16,101	34,591	1,400,000*	21,882	1,456,400*
1931	21,900	15,355	37,255	1,020,991	20,924	1,079,200

*Estimate

Table 9: Students as a Percentage of Population (All Figures in Thousands)

Year	Total Population	20-24 Population	University Students		All Students	
			as % of total population	as % of 20-24 age group	as % of total population	as % of 20-24 age group
1861	20,066	1,829	0.016	0.185	0.035	0.383
1871	22,712	2,004	0.024	0.277	0.203	2.296
1881	25,974	2,328	0.040	0.453	0.289	3.222
1891	29,003	2,646	0.055	0.605	0.579	6.350
1901	32,528	3,120	0.054	0.572	0.953	9.936
1911	36,070	3,175	0.073	0.832	2.235	25.386
1921	37,887	3,151	0.091	1.098	3.843	46,208
1931	39,952	3,494	0.093	1.066	2.701	30.882

Table 10: Percentage Growth per Decade in Student Numbers

Year	University Students	All Students
1861-71	164	657
1871-81	190	163
1881-91	152	224
1891-1901	111	184
1901-11	148	260
1911-21	131	180
1921-31	108	74

of the unreadiness of existing universities to respond fully to social change. In this process, the role of the emergent university colleges was crucial. In the event, their aspiration to break from the "technocratic" model and to conform with that of the Oxbridge college drove a wedge between "humane" and applied studies which was to prove immensely significant for English society in the twentieth century. It is that process which will be examined in conclusion.

The Dynamics of Growth:

It is clear that all these developing institutions wished to appear academically respectable. This was nowhere more true than in the provincial university colleges, where a recession from the "technological" ideal, and from part-time teaching, excluded many who turned instead to the technical colleges. Within the newly-chartered universities in the early twentieth century, much energy was devoted to the resuscitation of the liberal arts. It is significant that the Yorkshire College at Leeds was at first excluded from the federated Victoria University on the grounds that its curriculum was insufficiently balanced, failing to offer a liberal education. No sooner was the new University of Birmingham legitimized by the grant of a charter in 1900 than its first Vice-Chancellor, Oliver Lodge, was lamenting "the unfortunate impression abroad that Birmingham either does not possess or does not encourage a Faculty of Arts. This impression has an obvious historical origin."[26] Under his energetic guidance, the arts faculty had trebled in size within twelve years. By 1905 Lodge was already claiming that a general B.A. at Birmingham could offer "a general education in the knowledge of the time."[27] This shift towards arts and pure science rather than applied science was not universally welcomed. In 1911 a local ratepayers' association angrily petitioned the Privy Council:

> So far as the Birmingham University as such is concerned, it is of no use whatever to the industrial classes; as far as we can see all that has been done by the merging of Masons Science College into the University has been to divert the funds intended for ... the industrial classes to the

26. Vincent and Hinton, *op. cit.*
27. *University Review,* 2 (1905), 31.

use of the wealthy classes, and now the middle and working classes are being asked to contribute towards the education of the wealthy and well-to-do.[28]

This process seems to have been sustained into the inter-war years and paralleled elsewhere. In 1918, Sir Charles Grant Robertson, the Dean of Arts, lamented the general impression that Birmingham University was no more than a glorified school of applied science.[29] Under his direction the policy of vigorous expansion in arts was maintained. Similarly at Leeds, both Michael Sadler and J. B. Baillie, who succeeded him as Vice-Chancellor, attempted to resurrect the collegiate ideal, pressing the scheme of a "community housed in a pleasant landscape around an artistic set of buildings."[30]

This reversion from the applied sciences reflects the strength of the university model with which the late-nineteenth century pioneers had tried to break. It also probably indicates the class exclusivity of higher education, as dons in the new provincial colleges began to fear they were ministering, through applied science, to social groups for whom the university was not the proper preserve. It must not be forgotten, too, that, during this period, the provincial colleges were largely staffed by the products of Oxbridge. At all events, whatever the reasons, there seems to have been some retrenchment along traditional lines in the Redbrick Universities in the years after 1900.

Within the technical colleges there were also growing reservations concerning the extent to which the universities had usurped major responsibility for vocational instruction. In 1909, George Beilby told the Association of Technical Institutions that the time was ripe for its members to reclaim prime responsibility for technical training:

> Some of the universities have given us a noble lead in our earlier development, but I am bold enough to think we have outgrown that lead. ... I discriminate sharply between the function of the technical college, the training of large numbers of competent craftsmen or professional men, and the development of a smaller class of scientific pioneers.[31]

Another element in the dynamic of change was the increasing involvement of the state in planning the function of these higher educational agencies. As Armytage has pointed out:

> The civic universities in their struggling years, and the university colleges all along, owed the very existence of their arts faculties and in many cases their pure science faculties to the presence of a large body of intending teachers whose attendance at degree courses was almost guaranteed by the state.[32]

By the early twentieth century the pattern of growth in all areas was effectively controlled and directed by governmental agencies. This development had been prefigured by the Samuelson Report, which called for state funding of scientific enterprise, and by the Devonshire Commissioners who, in 1875 had gone so far as to rec-

28. Public Record Office, Education 119/1.
29. Vincent and Hinton, 106–7.
30. Shimmin, 38.
31. *University Review*, 45 (1909), 643–6.
32. Armytage, 256.

ommend that under a Ministry of Science the state should assume general responsibility for the direction of scientific instruction at every level.[33] But it was the growth in numbers, accompanied by the development of significant industrial and scientific research at the universities, in brief the move of higher education to a more significant position within the economy, which impelled the anxious governmental supervision of all new departures and expansion. From 1889 a Treasury Committee, prefiguring the U.G.C., disbursed grants to the new colleges. In response to Fabian demands the annual commitment grew to £ 54,000 by 1904. A separate Development Commission, concerned to ensure the supply of food for a growing population, became an important agency sponsoring agricultural education and research. By at once depriving British industry of vital German products the 1914 war provided a further twist. The D.S.I.R. (1915) and the formalization of the U.G.C. (1919) were direct consequences of the radically changed situation resulting from this crisis.

This governmental involvement was frequently cloaked in a "laissez-faire" philosophy which disguised the degree to which central management went on. In July, 1910, for example, Lloyd George fobbed off an anxious deputation from Southampton, where local aspirations for a university were currently under threat, with a demand for greater local initiative. He compared Southampton unfavorably with Bangor,

> with only 15,000 in a North Wales town, where there are no great industries, no great liners running to South America, no Cunarders. ... I am sure you will agree with me you can do more. I, as long as I am here ... want to know what the localities are prepared to do. When you come into contact with Chancellors of the Exchequer and ask us to do this or that for the locality, we are all alike in one respect: we help those who help themselves.[34]

Perhaps a truer index of the close involvement of the government at this period is provided by the exhaustive report supplied by G. T. Beilby, who was in 1914 commissioned to inspect, for the Board of Education, all departments of Applied Chemistry.[35] Indeed, many academics at this time feared the stultifying influence of governmental planning. In 1911, Oliver Lodge pleaded with the Board of Education for greater autonomy in planning courses:

> The increased Government grant raised ... many important questions as to the autonomy of universities in the management of their own affairs. Universities ... should not become appendages of State Departments of the Civil Service. ... The only reasonable way was to trust the institutions and the experts called together to manage them.[36]

It is possible, then, to discern two major elements in the dynamics of growth. First, traditional elite views of the function and style of a university clearly influenced the pattern of growth of the new university colleges. Secondly, enhanced size and economic significance attracted greater financial support from the state, and with it a growing determination to oversee the structure of this developing system. With hindsight, the claim that the role of the U.G.C. was advisory rather than supervisory until at least 1950 seems to lack validity.

---

33. Devonshire Committee, *Scientific Instruction, Eighth Report* (London, 1875), 27.
34. P.R.O. Ed. 119/67.
35. P.R.O. Ed. 119/27.
36. P.R.O. Ed. 119/1.

Perhaps paramount in determining the pattern of expansion was the strong sense of hierarchy within English higher education, which was briefly threatened by the kaleidoscopic nature of these changes but which, in the event, remained as strong in the 1920s as seventy years earlier. In 1882 William Siemens had argued to the Samuelson Commissioners the distinctiveness and preferability of the university to the polytechnic.[37] In 1902, Ashley was keen to emphasize that his infant Faculty of Commerce at Birmingham had as its primary object

> the education, not of the rank and file, but of the officers of the industrial and commercial army: of those who as principals, directors, managers ... will ultimately guide the business activity of the Empire.[38]

In the *University Review* three years later, W. McDougall claimed that Oxbridge life was "on a different and altogether higher plane"[39] than that enjoyed in other institutions. Similarly, in 1932, Ernest Barker was not alone when he warned that "it is a great mistake to blur the distinction between university and technical college."[40] The grounds on which the case was made may have shifted in response to a changed situation, but the central point remained, that English society was best served by a clearly designated and hierarchical system of higher education, with democratization taking place through new compensatory institutions rather than the complete restructuring of the old. If we are to seek a single most potent factor in explaining the peculiar structure of higher education which emerged in England between 1860 and 1930, it is probably to be found in a national preoccupation with social hierarchies.

37. Evidence given in March, 1882; see *Technical Instruction*, 3 (London, 1883).
38. W. J. Ashley, *The Faculty of Commerce in the University of Birmingham; its Purpose and Programme* (Birmingham, 1902).
39. *University Review*, 7 (1905), 147.
40. Armytage, 267.