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Approaches to Technical Education in Nineteenth-Century England: Part IV. The Liverpool Mechanics' Institution

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Mechanics' Institutes, both collectively and individually, have been the subject of so much scrutiny and analysis that at first sight it would appear rather difficult to say anything new of them. Nevertheless, it seemed to us that Liverpool Mechanics' Institution had at least two unusual features which made it sufficiently different for it to warrant closer attention than it has hitherto received. One of its early ventures, namely the setting up of schools for the sons of its members proved immensely popular and, although one or two other Institutes attempted to emulate Liverpool in this, none met with the success attendant on Liverpool's initiative. The other enterprising move was the attempt to establish a 'Higher College'; this was not intended to be a superior kind of technical college but a college in which full scope was to be given to 'liberal' subjects as well as to science and technical subjects. It was in essence an attempt to create a 'civic' university and it was intended to do for Liverpool what Owens College had done for Manchester. None of the civic universities which emerged at the end of the of the nineteenth century could trace their origins to a mechanics' institute [1] and had this endeavour succeeded the distinction would have been unique to Liverpool. But it failed for a variety of reasons, predominant among which was the inability to realize that an educational establishment had to be adequately endowed. Owens College received endowments amounting to £300,000 from John Owens and Joseph Whitworth; the Directors of the Liverpool Mechanics' Institution neither received nor actively sought such lavish support, but attempted instead to operate Queen's College on a self-financing basis—foolishly as events were to prove.

The Liverpool Mechanics' Institution was not the first establishment of that kind to be set up in Liverpool. It began in 1825 as the Mechanics'

School of Arts (renamed Mechanics' Institution in 1832), but it had been preceded two years previously by the Mechanics' and Apprentices' Library. In 1839 another Institute—the Northern Institution—was founded in the centre of the City and in 1848 the Woolton Mechanics' Institute was established in the village of Woolton, six miles south of the City centre. But it was the Mechanics' School of Arts which dominated the scene in Liverpool.

It began modestly enough with classes in a disused chapel in Sir Thomas Street (on the site of the present Education Offices) and in Parker Street. It was founded largely on the initiative of several of the Directors of the Royal Institution. This was established in 1814 'for the promotion of literature, arts, and science', and catered mainly for the middle classes, but it shared many common features with the Mechanics' Institution. The sponsors of the Mechanics' Institution included Dr. T. S. Traill (an Edinburgh trained practitioner), Sir John Gladstone (father of W. E. Gladstone), William Rathbone, merchant, and Benjamin Heywood, a banker, the latter two being noted Unitarians. These were particularly strong on Merseyside and it is no surprise to find that during the first thirty years no fewer than six Unitarians were elected President of the Institution.

Many prominent public figures participated in the programme (lectures were given on Wednesday and Saturday evening) at considerable expense to the Institution. They were drawn not only from Liverpool but also from London, Glasgow, Bristol and other major cities. One of the most colourful characters was the Rev. Dionysius Lardner. [1] Others included Sir Lyon Playfair, who in 1844 lectured on the applications of chemistry to agriculture and horticulture, and Edward Forbes who later became Professor of Natural History at the Royal College of Science. Notable Liverpool per-

sonalities who lectured were the Rev. James Martineau, Minister of the Paradise Street Unitarian Chapel and the foremost Unitarian theologian in England who lectured on astronomy and chemistry as did another Unitarian, W. S. Jevons, who later became Professor of Political Economy at Owens College. The evening lecture programme was not confined to the purely academic but frequently reflected topical and practical matters of concern. The political complexion of the supporters of the Institution was Whig but despite this the first President, William Huskisson, was a Tory.

From the beginning classes at an elementary level were provided in drawing, arithmetic, mathematics and the various branches of science. These proved to be immediately popular, upwards of a hundred young men receiving instruction. The teaching method adopted was one of 'mutual instruction', each member of the class having to deliver a lecture on a specific topic and this was followed by a discussion among the members of the class.

In 1832 there were mutual instruction classes in geometry, chemistry, mechanics, natural history, archaeology and commerce but there were in addition classes taught in more traditional fashion in drawing, architecture, French, Spanish, German, Italian and Sciences. Hudson commented in 1851 that the Mechanics' Institution 'has arisen from a small society meeting in a chapel schoolroom to be by far the most extensive establishment of the kind in the Kingdom'. [3]

Although the Institution passed through two periods of financial stress (the first few years and around mid-century), it is nonetheless true that it was a very wealthy educational establishment by the standards of the day. By 1839 over £6,000 has been denoted to a special building fund, and in that year its income was £3,569 and total membership 3,478. This was made up of 500 life members, 1,526 annual members, 100 quarterly members, 636 sons of members, 243 apprentices to members and 473 ladies. The fee for an individual annual membership was one guinea and donors of sums exceeding £150 were classed as life members; these included Richard Vaughan Yates (£675), James Mullineux, (£650), George Holt (£230), and William Rathbone (£175) all Unitarian merchants, and James Muspratt (£620), alkali manufacturer. This wealth enabled the Institution to establish a library, museum and art gallery as well as a thriving day school for boys and to embark on an expensive programme of public lectures in addition to the provision of classes. All this was made possible by the move in 1837 to a spacious new building in Mount Street erected at a cost of

£11,000 on land granted free by the Corporation. From that time to mid-century the Institution organized a wide range of public lectures and evening classes in a variety of vocational and cultural subjects. Hudson claimed that during the period 1840-1849 no fewer than 118 lecture courses composed of 508 individual lectures were given. [4] For example, in 1848 Dr. Sheridan Muspratt, one of James Muspratt's four sons, delivered a course of three lectures on Sulphur, Soda and Coal Gas, which must have aroused considerable interest as the problem of sulphur waste was of real concern to the soda industry.

Towards mid-century the public lecture programme suddenly collapsed. Although the expenses incurred in bringing lecturers from all parts of the country were a drain on the resources of the Institution, this was not the cause of the failure of the programme. From 1840 to 1845 attendance at lectures varied from 700 to 1500 but by 1849 it had dropped to 300. In the following year in an attempt to revive interest the lectures were re-organized into structured courses entitled 'The Physical Phenomena of Nature' and the 'History and Distribution of the Human Race', but these proved to be no more popular than the earlier programmes of courses on a number of different topics and public lectures were abandoned. An attempt was made to revive them in 1859 when two courses of six lectures were arranged, one on Astronomy and the other on Chemistry. Working men were admitted to the gallery on payment of a penny per lecture but as the annual report commented: 'The attendances, however, did not encourage your Directors to incur further expenses in this direction'. [5] Hudson accounts for this loss of popularity of public lectures in terms of a 'change in public taste' and it is not without significance that public lectures were abandoned many years earlier at the Royal Institution and the Collegiate Institution, a Church of England rival to the Mechanics' Institution in Liverpool.

In the meantime the instruction classes in the Evening School continued to grow in popularity. In 1843 there were thirty-three, embracing a wide selection of topics in the pure and applied sciences; thirty-one masters were engaged on this work and the attendance averaged 393 per evening, a sizeable proportion of whom were apprentices and young mechanics. Thus encouraged, the Directors in 1854 announced the establishment of a new School of Science and Art in connection with the Department of Practical Science and Art under the Board of Trade. A prospectus was issued in which it was stated that the 'instruction is calculated to form a useful addition to the ordinary education of young men about to enter

an apprenticeship with merchants or traders.' [6] It was not intended that this should provide elementary instruction for 'students must be of the standard of fourteen-year-olds leaving the day school of the Institution'. A two-year course was planned in which a total of 440 hours instruction was devoted to basic sciences during the first session and 600 hours of instruction in drawing, geography, applied mechanics and applied chemistry were provided in the second year. The relevance of the course to local industry may be judged from the applied chemistry course, though it may be doubted whether young men of fifteen or sixteen years of age would have been capable of following it in any depth. The syllabus contained: fuels and their efficiency, electro-plating; the formation of alloys; bleaching, dyeing and soap-making and the manufacture of colours; oils; cements; coal gas and pharmaceutical by-products. A chemistry laboratory was fitted up for the purpose of this two-year course, the fee for which was eight guineas.

The setting up of this course reflected sound thinking, but the annual reports for the next few years made no reference to it and it must be assumed that the science part of the scheme came to nought. It is well known that the Department of Science and Art's original scheme of sponsoring Trade Schools and Schools of Navigation was not very successful and by 1859 when the regulations of the Department were changed there were only a few schools being sponsored by the Department and Liverpool was not one of those. The Liverpool Mechanics' Institution did not appear in the Department's annual reports until 1867. It seems fairly clear, then, that the grand plan of the Institution did not receive the sanction of the Department but the art classes of the evening school, however, were recognized by the Department as the South Liverpool School of Art.

Shortly after the Department changed its regulations there was formed in Liverpool a School of Science, the express purpose of which was to run science classes in conjunction with the Department. The School of Science was something of a misnomer for there was no 'school' in the sense of there being a central building; it was merely a number of classes held in a variety of centres. The Mechanics' Institution became one of these centres and soon the largest classes of the School were held in the Institution. The School of Science was a technical college in embryo, though forty years were to pass before it became a fully-fledged technical college housed in a central building. Had the plan of the Directors of the Mechanics' Institution been put into effect in 1854 the Institution, and not the School of Science, might have been

the progenitor of the City's technical college. The Mechanics' Institution was wealthy, whereas in comparison the School of Science could be said to exist on a shoestring. Further, the Institution in contrast to the School of Science had adequate equipment and was well blessed with fine accommodation. It is a matter of speculation as to why the Directors of the Mechanics' Institution did not proceed with their plan in spite of their failure to gain recognition by the Department of Science and Art.

In 1856 the name of the Institution was changed to the Liverpool Institute and in the following year the Directors embarked on another undertaking. Had this succeeded it might have been the beginnings of a university. This was the setting up of Queen's College and was clearly inspired by the creation of Owens College six years earlier in Manchester. To obtain a London degree it was necessary for a student in any part of the country to possess a certificate showing that he or she had received a period of continuous instruction at some 'recognized' institution. There were about twenty such centres and Owens College was one of these. In 1857 Queen's College was given authorization to grant such certificates. The object of Queen's College was 'to provide such instruction as would be of material and immediate service in professional and commercial life.' [7]

Three new lecture rooms were built specifically for the College in 1859 and professors were appointed in Greek, Latin, French, English, German, Hebrew, history, logic, political economy, law, mathematics, natural philosophy, chemistry, animal physiology, botany and civil engineering. The fee charged to students was five guineas for one hundred lectures, the professors receiving four-fifths of this. Evening Classes were started in these subjects and, in addition, in bookkeeping, Italian and geology. During its lifetime of twenty-four years classes were arranged in no fewer than twenty-two subjects, but in only seven of these was there anything like a constant degree of success. These seven subjects were English, French, German, Latin, Greek, mathematics and chemistry. Day classes were begun in 1863 but were discontinued in 1870 'as they never afforded an adequate inducement to their continuation', the average number of students attending the day classes in that period being only fourteen. This could in no way be attributable to the poor quality of teachers for the individuals appointed to professorships were men of repute. They included: James Campbell Brown in chemistry, a lecturer at the Royal Infirmary School of Medicine, who later became the first professor of chemistry at University College, Liverpool; George Frederick

Deacon in engineering, who at the age of twenty-nine was appointed joint Borough Engineer and Water Engineer in which capacity he was largely responsible for the Vyrnwy water scheme and William Stanley Jevons in political economy, who later became a professor at Owens College and at London University.

The numbers of students attending classes at Queen's College was disappointingly small and few proceeded through the College to the London degree examinations. J. T. Danson, a President of the Institute in 1862, in his report as Chairman of the College Council to the Directors of the Institute on its closure in 1881, attributed this to the imperfect means of financing the College. The income was entirely derived from students' fees and the expenditure was limited accordingly and when it was finally disbanded the College had cost the Institute £2,338. The Council observed that 'in no instance whatsoever, in Europe or America has a College of the description of Queen's College had any material success, except when supported by endowments sufficient to render the teachers independent of the fees from pupils'. It is far from certain that this was the prime cause of failure of the College though endowments comparable to those given to Owens College would no doubt have ensured its success. The subjects most popular in the evening classes were Latin, Greek, French, German, English and mathematics and the least popular were chemistry, natural philosophy, natural history, engineering and geology. [8]

In 1875 there were 179 in attendance at classes in the popular subjects but only 30 in the second group of subjects. In the same year there were no fewer than 790 attending the science and technical classes of the School of Science. An unanswered question is why it was that the School's classes which were held in inappropriate accommodation and lacked the most essential apparatus were successful, and yet classes in the same subject in Queen's College having admirable facilities and accommodation attracted few students.

The College Council claimed that there was competition between itself and the School and that it was at a disadvantage compared to the latter as the School received a 'large share of public aid'. This, however, was not quite correct. The classes at the School were 'recognized' by the Department of Science and Art and 'payment-by-results' grants were made to the teachers. But the School had still to meet all the expenses involved in accommodation and equipment. There must surely have been a less tangible reason than this. Was it that the artisans, clerks, and teachers who attended the School's classes found the studies there more relevant than the preparation classes

for matriculation and for degrees at Queen's College? Another argument put forward was that students entering Queen's College were ill-prepared and poorly educated because of the inadequacies of elementary and secondary education in the City but the same could be claimed for the School of Science and later for the University College. But despite the disparity in numbers attending the School's classes which were scattered widely over all parts of the City and those attending the Queen's college, the mistake was in adjudging the College to be a failure in the light of this. In 1867 there were 270 attendances at the College classes and in 1875 there were still 223 in attendance. The College was only a failure in that this figure was too low for the income from fees to meet the expenses. Both the School of Science and University College went through crisis periods before success came and had the Directors persevered by launching a special appeal for subscriptions instead of making it self-financing it would have been enabled to carry on. Ironically in the same year it was closed down University College was established.

If the hopes of the Directors in this direction were not fulfilled they were more than adequately rewarded for their courage and foresight by the success attendant on one of their early initiatives, namely, the setting up of a day school—and this ensured for the Mechanics' Institution an important place in the educational history of Liverpool. It is through the Liverpool Institute High School for Boys that the Mechanics' Institute lives on and it is for its pioneering role in secondary education that it is now remembered.

This began when Richard Vaughan Yates and James Mullineux wrote to their fellow Directors of the Institution calling for the establishment of a Day School for boys. They offered to provide £1,000 if a sum of £5,000 was guaranteed by the other Directors. 'It might be advisable,' they said, 'first to provide instruction in those branches of knowledge which are less attended to in many other schools and postpone, if necessary for a short time a provision of instruction in the classes'. [9]

The School was opened in April 1835 in the rooms occupied by the Institution for its evening classes in Slater Street. Robert Landers of Edinburgh was appointed Superintendent Head of the Day School, the true purpose of which was stated to be 'to fit the pupils to understand and appreciate the evening classes'. The education was offered on inexpensive terms, 35s a year for the sons of members and 45s for others. The only secondary education in Liverpool at the time of formation was provided by private tutors, private schools and

the small Royal Institution school which provided a mainly classical education for sons of the prosperous middle classes and the fees charged by the Mechanics' Institution were considerably cheaper than those charged by the Royal Institution and the Collegiate Institution School established five years later. The Day school was immediately successful, eighty boys enrolling in the first session and by 1838 there were over two hundred in attendance. In that year a High School was added to the plan of the Institution. This was intended for the sons of the wealthier members of the community, fees being eight guineas per annum. There were six departments: English; mathematical and commercial; philosophical; classical; French; and writing and drawing. Following the creation of the Oxford Local Examinations in 1858 the School became oriented towards success in those examinations and it was soon heading the list of successes of all schools in the country. It also placed great store in boys gaining places at Oxford and Cambridge and over a thirty-year period thirty-five boys from the High School won scholarships to those universities.

The teaching of physics and chemistry was given full scope from the commencement of the School (laboratories being provided in both subjects a very rare occurrence in England at that time). It was highly praised for its science teaching by Mr. James Bryce, Assistant Commissioner for the North-West to the Schools Inquiry Commission in 1868. The Rev. J. Jones in evidence to the Commission stated that: 'There is no school in England where chemistry is taught to the same extent as it is with us.' [10]

This concern with science was demonstrated throughout the century. In 1881 the Directors stated that the demand for science teaching had grown so large that they had decided to add a new laboratory for the teaching of practical chemistry for the use by advanced pupils in the High School and in their report for 1896 the Directors stated that they had long been aware that the chemistry laboratory was inadequate and that it was necessary for them to make better provision for the teaching of chemistry. To meet this they demolished the upper storey of the East Wing (in which the School of Art was formerly located) and erected a new chemistry department. In the same year the physics laboratory was reconstructed. The teaching of science was a late development in the curriculum of the public and endowed grammar schools of England and the Rev. Jones's remark to the Taunton Commissioners was not at all the vain boast that it seems.

In 1856 the Mechanics' Institution was restyled the Liverpool Institute and School of Art, an

opportunity being taken at the same time to retitle the Lower School as the Commercial School. This School grew in popularity throughout the century; by 1881 there were 800 boys in attendance. In 1895 it became an Organized Science School under the Regulations of the Department of Science and Art and as such was in receipt of grant from that body. In 1905 both Schools were transferred to the City Council.

Shortly after the establishment of the two schools for boys the Directors turned their attention to the education of girls and in 1844 they were enabled to open a High School for Girls as a result of the generosity of George Holt, a Unitarian merchant. He donated, rent-free, Blackburne House, an imposing early Georgian mansion situated in close proximity to the Mount Street building. The School began with 291 pupils and by 1880 this had increased to over 400. Like the boys' schools a special feature of the school was the teaching of science. In 1877 Mr. J. G. Fitch, an H.M.I. commented that the school was one of the best of its kind in the country.

The Liverpool Mechanics' Institution (or Liverpool Institute as it was later known) created a range of educational provision which was scarcely equalled elsewhere, certainly not in Liverpool itself. The educational needs of all, from the age of eight at one end of the scale to mature adults at the other, were catered for; secondary education for both boys and girls; commercial education, classical education, technical education, higher education and adult education in several forms were provided. This was bold and imaginative thinking. That hopes were not fulfilled at all points is scarcely to be wondered at for institutions such as the School of Science and the University College with objectives far more limited were fortunate in surviving their early difficult years. There were many factors which stood in the way of progress; poor elementary schools; lack of scholarships from elementary to secondary schools and from secondary schools to higher educational institutions; inadequate funds and the emphasis on instruction during the evenings when students, artisans especially, were tired after long and arduous hours in works or offices. The remedy for those lay outside the Mechanics' Institution. Such obstacles to educational progress were not removed until the early years of the twentieth century.

It is often maintained that many Mechanics' Institutes emerged in a new guise during the second half of the nineteenth century as a result of their involvement in technical education. Others attempted to set up schools without success. The Liverpool Institute achieved a unique distinction; it could fairly claim that no other Mechanics'

Institution had such breadth of vision or attempted so much in so dynamic a fashion. Its permanent lasting achievement was the establishing of a strong tradition of secondary education for boys and girls in Liverpool. It is to be regretted, nevertheless, that its other initiatives did not meet with the same success and consequently are no longer remembered.

References

1. We feel that Birkbeck College (University of London) comes within a different category.
2. The Rev. Dr. Dionysius Lardner was the first Professor of Natural Philosophy at University College London. He and his courses caused more trouble than any other lecturer or subject. He figured prominently in the public eye and moved freely in fashionable literary society. A popular and successful lecturer, he won favour with audiences because of his extensive use of apparatus. He resigned his chair after a few years as he did not consider his remuneration to be sufficient, and he subsequently went on a lecture tour of America.
3. Hudson, J. W. (1851). *The History of Adult Education*, p. 96.
4. *Ibid.*, p. 101.
5. *Annual Report, Liverpool Mechanics' Institution* (1859).
6. *Ibid.*, (1854).
7. Danson, J. T. (1881). *Report of the Council of Queen's College to the Directors of the Liverpool Institute* (in Liverpool Local Record Office).
8. Surprisingly, a sub-committee set up in the 1870s to investigate the need for a higher college reported that the chairs most necessary were in physics, chemistry and engineering.
9. Tiffen, H. J. *History of the Liverpool Institute Schools, 1825-1935*, Liverpool Institute Old Boys Association, p. 27.
10. *Schools Inquiry Commission* (1868), Vol. IV, p. 583.

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