THE SCIENCE AND ART DEPARTMENT

1853-1900

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PART TWO

INSTITUTIONS AND INSTRUMENTS

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a) Schemes before 1859

i) The basic difficulties

Playfair's difficulties in developing a system of instruction in Science which would parallel the provisions made for Art instruction were three-fold. First, he had to deal with a metropolitan establishment, on the staff of which he had served, which was headed by a strong-minded Director who had initially been his patron,but who came to resent what he regarded as interference. The problems of working with de la Beche and, later, Murchison, added to Playfair's difficulties with his political chiefs, and they were to affect his whole policy for the development of Science facilities, which was based on a strong and co-operative Central Institution. They must, therefore,be briefly alluded to from time to time in this section.

Secondly, Playfair, unlike Cole, had no real provincial foundation on which to build. "The Department found much prepared (in Art) and a feeling for it already created in the public mind" Science had "many difficulties to surmount and much to organise", he could rightly say.[1] Thirdly, Playfair had to develop a demand for Science teaching in a society where it was not by any means appreciated as necessary, where the teachers to give the instruction did not exist, and where the basic primary education, on which a secondary structure could be erected, was deficient. When, in the third year of the Department's existence, the services of a teacher of Chemistry were offered to "middle-class and grammar schools" in the London area, there was not a single reply.[2] The limited facilities for science instruction in the middle years of the nineteenth century have been detailed.[3] "Try Oxford and Cambridge as we might, they will never become places for industrial education, which is our present object", the Consort's Secretary believed at the time the Department was created.[4]

ii) A separate organisational scheme

Cole's original plan appears to have envisaged provincial schools which would combine facilities for Science and Art instruction,[5] and in Playfair's dealings with de la Beche,he too would seem to have been thinking along these lines.[6] In February 1853, however, both officials "agreed that no professions should be made in teaching science in district schools".[7] The scientific

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1 Address at the People's College, Sheffield, 25 October 1853
2 S.C.S.I. A. 8244 (J.C. Buckmaster)
3 Chapter I Section (e)
4 MS letter Grey to Cole 2 February 1853
5 Address of November 1852
6 MS letter Playfair to de la Beche 20 August 1851
7 Cole MS Diary 10 February 1853

instruction which was given developed, therefore, in separate institutions, probably because it had to be given where demand arose. Such a demand did not necessarily coincide with that for instruction in Art. A few institutions were already in existence, and in other areas, teachers with some scientific training could be induced to co-operate with the Department. "Science has not yet exercised its full influence on your district because there has not yet existed a race of men to translate its abstractions into your utilities", Playfair told an un-named pottery manufacturer in the first months of the new Department's existence. "It is important that your artisans should have a practical acquaintance with Chemistry", he went on. "Why should you not have a School of Industrial Knowledge instead of Art only?". He ended by offering to prepare a plan for instruction.[1] He would thus appear still to have been considering a "combined operation", but such Schools did not originally develop.

iii) A meagre response

While there may have been no structure, there was some provincial demand. Birmingham,[2] Bristol,[3] the Potteries and Newcastle-on-Tyne[4] authorities all asked to be "connected with the Central School". A few Schools in connection with the Department were founded,[5] and science drawings were added to the diagrams which it would supply.[6] (These found illustrious subscribers in Florence Nightingale[7] and the King of Siam[8]). Yet in successive years Playfair had to admit that there were "only one or two Schools"[9] and that "growth will be comparatively slow".[10] Attempting to inspire provincial enthusiasm was "dreary and weary work", said Playfair later. "There was little response ... my voice sounded to myself as the voice of one preaching in the wilderness".[11]

1856 saw renewals of proposals for Science instruction. There was a long discussion with their host, Lord Ashburton, about a proposed House of Lords Committee "to do something for Science", when both Cole and Playfair spent a weekend in Hampshire.[12] Playfair, however, asked Cole to delay the appointment

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1 Draft MS letter by Playfair, no addressee, 17 June 1853 (Cole Correspondence)
2 D.S.A. 1st Report 398-401
3 Ibid. 403-405
4 Ath. 26 February 1853
5 D.S.A. 1st Report xxx-xxxi
6 D.S.A. 2nd Report ix and 14-15
7 MS.M 5.54
8 MS.M 5.55
9 D.S.A. 2nd Report XXV
10 D.S.A. 3rd Report xxiv
11 Wemyss Reid op. cit. 152
12 Cole MS Diary 12 January 1856

of such a Committee.[1] This could have been because he felt that there was so little progress to report, or it may have been due to his desire to await the results of reorganisation under the Lord President. Proposals by Heywood for a Commons Select Committee to enquire into science instruction were also deferred. Such an enquiry would be "vague and indefinite", said Stanley, the President of the Board of Trade, and Palmerston, the Premier, doubted the practical results. Heywood promised to return to the matter in the next session, but nothing more was heard of such a scheme for another decade.[2] When the Department was united with the Education Department under the Lord President, Playfair returned to a previous theme, that there was a need "first to infuse Science into primary education",[3] and, in doubting any real progress so long as the primary schools were "too far apart from the secondary schools", he urged a concentration in the primary field on the "sciences of observation" (Zoology, botany and physiology") both in schools and Training Colleges.[4]

Despite his relative hopelessness at the time of his greatest troubles with the Central School, which caused him to hint at inevitable failure in a letter to the Consort's Secretary,[5] Playfair continued to plead for increased science instruction. This would, he argued, "prepare the working classes for a more intelligent appreciation of the principles of their employment;"[6] and he urged the creation of local Mining Schools as "feeders" for the Central School, which, he argued, would not flourish until they existed.[7] However, he seems to have done nothing about a Science Directory which would list the subjects offered and the aid which would be given, when this was suggested to him by Cole.[8] In his last year with the Department, he could report that he had visited each of the existing Schools twice in the course of the year and conducted examinations. (This reveals that, despite Cole's title of Inspector General, Playfair continued to exercise "inspectorial" functions.) He could, however, see no speedy prospect of self support.[9] He appears to have felt that he had achieved little in his five years of endeavour, and his disillusion in the face of general and specific difficulties, as has been recorded, led to his partial, and eventually complete, withdrawal from the affairs of the

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1 MS letter Playfair to Cole 12 January 1856
2 Hd. CXLII (1856) 1263-1273
3 D.S.A. 1st Report xxxi
4 D.S.A. 4th Report xxxi - xxxii
5 MS letter Playfair to Phipps 13 July 1853 [Chapter VII Section (i)(a)]
6 Engr. 2 May 1856 (Speech at Bristol)
7 Address on "Science instruction in connection with the Department"n.d. 1857
8 Cole MS Diary 16 February 1857
9 D.S.A. 5th Report 22

Department.[1] His achievement may conveniently be summarised with reference to the four main types of Science institution which developed in these years.

b) Provincial institutions in the early days

i) Trade Schools

"Trade Schools" had existed for some years as institutions in which trades such as shoe-making and repairing, and sewing were taught, usually to pauper children. The title was suggested as an alternative to "Schools of Industrial Knowledge", "with interest, not discipline, as their motive", by the Consort.[2] Playfair did not like the title.[3] The public, however, liked the name, and "calls them Trade Schools". They were schools where boys were prepared for apprenticeships, by the study of subjects such as Chemistry, Mechanical Drawing and Mathematics, although trades as such were not taught. Schools were started as Wandsworth, Blackwall and Bristol.[4] The first two had perished by 1859, because they could not remain solvent, and the Bristol School would have vanished too, unless the Department, contrary to its public policy, had not made direct grants in aid of the teachers' salary[5] and in aid of equipment.[6] With the encouragement of Canon Moseley[7] the Bristol School eventually had a long and successful history under the Department. These Schools owed their origin to Playfair's interest and Cole's advice, although the latter stressed that they needed secure foundations and disclaimed any personal responsibility.[8]

ii) Mining Schools

Mining Schools were initially proposed by W. Warrington Smyth, of the School of Mines, with those of Silesia and Prussia as examples.[9] Early but unsuccessful attempts were made by the Department to raise them in Cornwall.[10] A successful School at Wigan was seen by Playfair as "the best means of implanting a taste for Science".[11] Local coalowners subsidised the School, and the master received an additional £30 salary for teaching Science in the local National School.[12]

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1 Chapter II Section (b) (ii)
2 Cole MS Diary 30 January 1853
3 Ibid. 10 February 1853 and D.S.A. 1st Report xxxi
4 D.S.A. 3rd Report xxvi-xxviii
5 S.C.S.I. A. 8248 (J.C.Buckmaster) and MS.M 12.147
6 MS.M 5.6
7 Biographical Appendix
8 Cole MS Diary 23 January 1856
9 D.S.A. 1st Report 417
10 Ibid. xxxii
11 Engr. 6 August 1858
12 D.S.A. 5th Report 20

iii) Navigation Schools

Two Navigation Schools, at Liverpool and in London, were taken over from the Marine Department of the Board of Trade at the Department's inception. It was proposed to extend this kind of School to all the principal seaports,with the teachers graduating from the Royal Naval School, Greenwich, and taking a further course at Jermyn Street.[1] The primary purpose of these schools was to prepare boys for the Merchant Navy, and they had another function, in helping adults to study, in broken periods ashore, for Board of Trade Certificates. Many of the pupils, however, "lacked the four rules, or are illiterate".[2] When the Department came under the Lord President, the supervision of professional subjects such as Navigation remained with the Board of Trade. In 1858, a Naval Officer, Captain Ryder, was appointed to carry out a Special Inquiry into their organisation.[3] In his Report, he came out strongly for payment on results, using the phrase and going into very fine details of a scheme of operation. (His use of the phrase "efficiency as their first object, and economy as their second," is Lowe of 1862 writ early.[4]) The Schools are important because of the "carry over" of certain subjects taught there in to the organised scheme for science teaching which developed after Playfair's departure.

iv) Science Schools

Some attempt was made to develop "Science Schools" where "instruction in scientific principles ... with no direct connection with special trades or industries", would be given. A "Draft for Science Schools" laid down conditions for their formation in 1857. Local Committees were to be formed, and they had to declare that students had passed examinations in basic subjects before admission and that the master was not employed in Primary Education, before the Department would assist with prizes, Exhibitions and payments on masters' certificates.[5]

v) The arrangements for aid

The financial arrangements for the Schools of Art are fully detailed in the Reports. The position is much less clear for the Science schools, which developed so slowly. Annual payments on their certificates were made to the few teachers who attended full-time courses at Jermyn Street.[6] "Something

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1 D.S.A. 1st Report xxxiii and ix
2 D.S.A. 3rd Report xxv
3 MS.M 9.48
4 D.S.A. 5th Report 143-161
5 Draft Form 205 (MS.M 8.21)
6 MS.M 5.25, 5.60, 5.97, 5.157

like an analogous system to Art was attempted in one or two places, either by paying an absolute salary to the teacher or guaranteeing his income", said Cole later. He added that there was some form of capitation payment, too, and agreed that "there was great variety".[1]

The slow growth of Science institutions before 1860 was due, as has been suggested, to the lack of real demand. The middle class fees which supported the Art classes werenot forthcoming, the need was not seen by manufacturers or many artisans; and the deficiencies in primary instruction were great.

c) The Science Subjects: general development

i) Major divisions

The five subjects of the 1859 scheme, on which aid would be offered,[2] had grown, by a process of sub-division and accretion, to 17 by 1863[3], and to 23 by 1870[4]. With further additions, deletions, and amendments, the total number of subjects remained at approximately that figure for the rest of the century. As the diagram on the next page shows, there were nine main divisions, although the Department at no time referred to them as such.

It could be argued that the five divisions of the original concept represented a rational approach to the basic problem of aiding subjects whose study would have eventual applications to industry, in the widest sense. The next major addition of a group of subjects, Mathematics, the "Navigation" subjects, and Physical Geography, in 1864,[5] was designed to encourage their study in the Navigation Schools. The first and last of these subjects, however, rapidly become popular because they could be so closely linked in evening classes with work done in day elementary schools, and they assumed an importance which was not originally intended. The group, in effect, added three more "divisions": the last of these, Geography, underwent considerable modification, as will be shown. The last additional subject to form a division of its own was Principles of Agriculture: Hygiene, it could be argued, formed a part of the "Natural History" division.

ii) A "new" subject: Physiography

The very rapid rise in the examination entries for Physical Geography[6] led to its elimination from the Directory, since it could be argued that it was

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1 S.C.S.I. AA. 41 and 44
2 D.S.A. 6th Report 13
3 D.S.A. 11th Report 16
4 D.S.A. 17th Report 114-131
5 D.S.A. 12th Report 1
6 Table XIV A

TABLE A ~ THE SCIENCE SUBJECTS

ORIGINAL SUBJECTS	6/13	PRACTICAL AND DECORATIVE DRAWING			PHYSICS				CHEMISTRY		GEOLOGY & MINERALOGY APPLIED TO MINING				NATURAL HISTORY				ELEM. MATHS	HIGHER MATHS	NAVN.	NAUT. ASTRON.	STEAM	PHYSICAL GEOG.	AGRIC.	HYGIENE
		P.P. & DEC. DRG.	MECH. & MACH. DRG.	BLDG. CONSTRN.	TH. MECH	APP. MECH.	AC. LT. & HEAT	MAG & ELEC	INORGANIC CHEMISTRY	ORGANIC CHEMISTRY	GEOL.	MINER	MINING	MET.	ANIMAL PHYS.	ZOO.	VEG. PHYS.	SYST. BOT.	SEVEN SUBDIVISIONS							
	11/16																									
	12/1			BLDG. CON & NAVAL. ARCH																						
(1860-1869)	13/13																									
	17/1																									
	24/1 & 37			BLDG CON. NAVAL ARCH.													BIOL.	EL. BOT.								
(1870-1879)																										
	27/1																									
	3.1/2																									
	33/43	AMALG. WITH PR. GEOM. (ART)																								
(1880-1889)																										
	36/1																									
	39/41																									
	40/18																									
	41/36																									
	44/51	(PR. Geom TO ART)																								
(1890-1900)																										
FINAL SUBJECTS		PRAC. PLAIN & SOLID GEOM.	MECH & MACHINE DRAWING	BLDG. CONSTRN. / NAVAL. ARCH.	THEOR. MECH. (SOLIDS) / THEOR. MECH. (FLUIDS)	SOL. FL.	EL. PHYS. / SD. LT & HT. / EL. ADV.	A.L.H.	MAG. & ELEC.	INORGANIC CHEM. (THEORY) / INORGANIC CHEM. (PRAC)	TH. PRAC. / ORGANIC CHEM. (THEORY) / ORGANIC CHEM. (PRAC)	GEOLOGY / MINERALOGY	MINING	METALLURGY (THEORY)	TH. PRAC / METALLURGY (PRAC)	HUMAN PHYS. / HUMAN PHYSIOLOGY	ZOOLOGY	BIOLOGY	ELEMENTARY BOTANY	MATHEMATICS		NAVIGATION / NAUTICAL ASTRONOMY	STEAM	PHYSIOGRAPHY	AGRICULTURE	HYGIENE

(FIGURES IN BRACKETS REFER TO ANNUAL REPORTS)

really a subject for "basic" rather than "industrial" study. The Department gave two years warning of the change.[1] (There was a temporary decline in overall numbers as a result.[2]) In its place was put "Physiography", which was "a new science of the Department's own which it has taken upon itself to invent!"[3] (A further reason for change was that many pupil teachers were earning grants on Physical Geography from both Departments. It was given up by the Department). The "new" subject was "etymologically concerned with the whole of Nature". Its invention was, in R.H.Gregory's opinion, wrongly attributed to Huxley, who "added some elementary information about the Earth's movement and the Sun's construction to some lectures ... and printed the resultant work as Physiography". The syllabus was in fact drawn up by Lockyer[4], while the credit for its inventionwas later claimed for Linnaeus.[5] It appears to have been an attempt to combine the elements of a number of natural and physical sciences into a study of their influences on the shaping of the environment, and it could thus be seen as a "scientific" study which could have "theoretical" value.

While the Athenaeum found Huxley's text-book to contain "the fundamental truths of Natural Science"[6], the Engineer found it "too general in its applications and too capable of the cram which he deplores".[7] Ansted, who had been the Examiner in Physical Geography, published his own book on the subject.[8] An H.M.I. believed it to be "an excellent subject if well defined"[9], and it soon rivalled its predecessor in popularity. However, "many ignore the astronomical aspects, and place reliance on merely expanding the elementary school teaching in Physical Geography", the Examiners reported in 1889.[10] In 1892, the standard of examination was raised,[11] and "sweeping changes" were made in 1896 when a year's laboratory study of the elements of the natural sciences was added to the syllabus.[12] It was still felt, however, that the subject had "acquired the name ... without acquiring a breadth of view".[13]

Advertisements and reviews in Nature show that text-books continued to be

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1 D.S.A. 24th Report 1
2 D.S.A. 25th Report 8
3 Engr. 15 June 1877
4 Nat. 27 December 1900
5 Ibid. 3 January 1901 (H.R.Mill)
6 Ath. 3 January 1878
7 Engr. 10 May 1878
8 Nat. 26 September 1878
9 R.C.T.I. A. 3517 (Sharpe)
10 D.S.A. 37th Report 211 (Judd and Lockyer)
11 Nat. 24 November 1892
12 Ibid. 24 December 1896 and Engr. 22 April 1898
13 Nat. 27 December 1900 (R.H. Gregory)

published until the First World War. It is a "subject" which few remember today, and as a synthesizing force it would appear to have met with little success, but in the last year of the Department's existence it had become the second most popular subject for examination.[1]

iii) Other "new" subjects: Agriculture and Hygiene

As a result of memorials from Agricultural Societies and other organisations, the Department added "Principles of Agriculture" to the list of subjects in 1876.[2] Returns show that entries for the subject developed from very small beginnings, with a preponderance of classes in Ireland,[3] to the point where it became a very popular subject indeed, with the reputation of being easy to pass. It was introduced in a direct attempt to influence an industry which was in decline, and provides an example of the very narrow dividing line between "abstract" and technological subjects, although Donnelly later argued that it was "the Art and not the practice" which was examined.[4] In 1884, as has been recorded, it was specifically excluded as a subject of study in areas where it was "manifestly inappropriate and useless".[5] From 1888, the standard of pass was raised, and certification that students presented for examination would enter farming was insisted upon.[6] Entries showed a very marked decline as a result.[7]

The last "new" subject to be introduced was "Hygiene" in 1883.[8] The "laws of Health" had first been recommended as a subject for encouragement in 1853.[9] The introduction of the subject was welcomed by Nature.[10] It rapidly gained in popularity, and by the end of the century occupied a place just one third of the way down the list of subjects in popularity.[11]

iv) Relative importance of the "divisions"

When entries for individual subjects for the last five years of the Department's existence are calculated,[12] it can be seen that one subject,

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1 Table XIV A
2 D.S.A. 23rd Report 2
3 D.S.A. 24th Report 153 January 1877: 89 classes, 55% in Ireland
D.S.A. 26th Report 184-257 " 1879: 146 " 76% " "
D.S.A. 27th Report 134-213 " 1880: 246 " 60% " "
D.S.A. 28th Report 189-259 " 1881: 354 " 48% " "
D.S.A. 29th Report 184-258 " 1882: 347 " 42% " "
4 R.C.T.I. A. 2845
5 D.S.A. 32nd Report 2
6 D.S.A. 36th Report ix and 1
7 Table XIV A
8 D.S.A. 31st Report 2
9 D.S.A. 1st Report 438
10 Nat. 16 May 1883
11 Table XIV A
12 Table XIV B

Mathematics, which forms a "division" of its own, was most popular. The "Mining" and "Navigation" divisions, which might be seen as those with the most direct applications, were considerably below the other divisions in popularity. "Agriculture",as has been recorded, was in a general decline, while the "Natural History" group, helped considerably by the addition of Hygiene, came just behind the last three divisions of Chemistry, Physics and "Building", which were of roughly equal importance. As will be recorded, the Department argued that the study of all subjects had equal value for eventual "industrial" applications.[1]

d) The machinery of payments on results in Science

i) The general principles

"We give no instruction in Chemistry but we give bonuses to induce people to learn Chemistry ... once certified, (teachers) go and secure a living where they please ... once the Local Committee certifies that a certain number of lessons has been given", said Cole in describing the basis of the system.[2] "The Department ... is merely an organising body ... teachers receive payments on the success of their results", explained J.C.Buckmaster.[3] "The whole system in fact hinges on examinations", acknowledged Donnelly.[4] An experimental approach, with "slow and gradual growth",was stressed.[5] The great appeal of the system to the officials was that standards of examination could be adjusted and payments could be regulated so that expenditure could be controlled. When Granville objected to a payment of £256 in one year to a teacher, a Minute was drafted and published which subjected payments in excess of £60 in future to proportional reductions.[6] A higher standard of marking was recommended by Donnelly,in 1864,"to keep payments down.[7] The salutary effects of these controls were quoted: there had been an increase in the numbers of schools, teachers and students, but a reduction in total payments of £160 in 1863-1864.[8]

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1 Section (g)
2 S.C.S.A. AA.295 and 583
3 Br. Assn. 1862 Report
4 D.S.A. 18th Report 85
5 D.S.A. 7th Report 27-37 and 8th Report 27
6 Cole MS Diary 17 August and 29 August 1863, D.S.A.11th Report vi and 1
7 MS.M 18.132
8 D.S.A. 12th Report 7

ii) Specific applications

"Amounts are liable to be decreased and even finally withdrawn", teachers and Committees were warned in 1865, presumably as a result of the outcry raised against the Art regulations of the previous year.[1] Since "some students were attempting papers beyond their knowledge", a division into Elementary and Advanced papers was introduced in that year.[2] Standards of papers were increased the following year, ostensibly to reduce this feature still further.[3] The abolition of the special teachers' examination in 1866, to "reduce expense and inconvenience", and the acceptance of a pass at first or second class at Elementary or Advanced level in any paper as a qualification to earn payments on results of teaching in that subject[4], caused much opposition, as will be recorded.[5] More detailed syllabuses were printed from 1868 "to prevent vague and desultory work".[6]

A limitation of £15 on payments on individual students was introduced in 1868.[7] The growing demand for technical instruction, and the need for more "advanced" work, caused a reduction in "classes" from five to three, with £2 and £1 as payments,in place of five classes which had "paid" £5 to £1,"to reduce the payments for elementary work ... to the lowest point compatible with efficient and wholesome stimulus".[8] While the Department claimed that these changes were "generally admitted to be judicious"[9], there was an outcry from teachers which threatened to equal the reaction shown by the Art teachers to the introduction of their new regulations in 1864, as will be recorded later.[10] Donnelly referred to "a check for a time in the rapid increase of classes", but he expected a recovery, which came, "if no further serious modification is made for some years", and referred to "an absurd report that ... papers had been returned to examiners with instructions to reduce by £20,000".[11]

Extra payments on students who answered questions in Chemistry which required "practical knowledge" were used to encourage such work,[12] and there was a threat that general payments would be reduced unless fees were charged to

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1 D.S.A. 13th Report 12
2 Ibid. 46
3 D.S.A. 14th Report 7
4 D.S.A. 15th Report vii
5 Chapter XI Section (B)(b)(ii)
6 D.S.A. 16th Report vii
7 Ibid. 6.7
8 D.S.A. 17th Report 1 and 46
9 D.S.A. 18th Report ix
10 Chapter XI Section (B)(g)(ii)
11 D.S.A. 19th Report 35
12 D.S.A. 18th Report 24

all students "as they would not value what was given gratuitously".[1] (This was followed by a general reduction in the proportion of students who paid no fees[2]). A successful attempt was made to reduce "hopeless" entries,by a regulation which reduced overall payments by sixpence a paper where entrants did not receive 10% of the marks.[3] An attempt to encourage systematic study by "grouped courses",[4] met with less success initially, but "certificate grabbing" was discouraged by a regulation limiting payment on any student to five subjects in a year.[5] A threat of reduction on payments where returns were delayed was also used to ensure their speedy transmission.[6] There was also a statement that aid would be reduced "where subjects are taken up in a desultory manner, and not as part of a continuous course".[7]

iii) The Departmental defence

"I am a very great believer in payment on results", Donnelly told the Technical Instruction Commission. "Teaching is a drudgery",he went on,"and to make a man's reward depend upon his exertions is an incentive you certainly cannot dispense with".[8] The Commission was concerned that there was no differentiation between payments on Elementary and Advanced work, and recommended that this should be introduced.[9] The implication that teachers neglected Advanced work,because it was not more attractive, was refuted by Donnelly, who said that there was no evidence to support this, and, in stating that he was against differential payments, reversed the position he had taken up soon after the scheme's inception.[10] On the question of "desultory" work, he said that the answer was "not more restrictions ... the instant you make a rule to meet some very minor evil, you have all kinds of memorials and questions in the House."[11] Despite this statement, a regulation in 1882 limited payments on any one student to three subjects in one year. It was carefully pointed out that this would not apply until the next academic year, to still any criticisms which might be expected.[12]

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1 Cole MS Diary 28, 29 and 30 December 1869, and D.S.A. 18th Report 33, 48
2 Table XLII and R.C.S.I. AA. 6432, 6435 (Donnelly)
3 D.S.A. 19th Report ix and 7
4 Ibid. 25-27 and D.S.A. 20th Report 40
5 D.S.A. 20th Report 3
6 D.S.A. 18th Report 20
7 D.S.A. 20th Report 40
8 R.C.T.I. A. 3573
9 Ibid. I 518 (Second Report)
10 Section (g)(i)
11 R.C.T.I. AA. 2878-2888, 3578, 3599-3600
12 D.S.A. 30th Report 1

The presenting of children for examinations, which particularly involved the "cram" which the Department deplored, was discouraged by a successive raising of the "Standards" from which children in elementary schools could enter.[1] This led to a temporary decline in total numbers[2] but it was hoped that it would lead eventually to a higher level of qualification. It was later claimed that this had proved to be "an effective check on cram".[3] Research showed that there was a rapid rise in the percentage of passes up to the age of 20, with a gradual fall from thence to 40 which, Donnelly argued, showed "the perfect way in which it has been systematised, since the examiners know nothing of the age of the pupils".[4] However, while still claiming in 1875 that "examinations may be employed as a thoroughly dependable test of the work of instruction", it is significant that he added that other criteria, particularly the teacher's training and the Inspector's report, must be considered.[5]

The marks allocated to each question were shown on the question papers from 1880. To answer the charge that this would induce candidates to attempt questions which were too difficult for them, Donnelly ordered research to be undertaken which showed that the highest percentage of successes came in the questions which carried the highest marks.[6] The standard of examination was raised for Agriculture in 1888, once the subject had become established[7]: other regulations which limited its study to rural areas[8] resulted in a general decline in the numbers entered for examination.[9] There is little doubt that the system of "checks and balances" was successful in its application: there is more room for conjecture on its continued application beyond the point where it could, perhaps, have been seen to have served its purpose.

e) <u>The organisation of the system of examining</u>

"Teachers whose pay depends entirely on examination have the right to expect that it shall be well done ... the men who set and mark the papers have to be the best available ... especially in the view of the laborious and repulsive nature of the work", believed Donnelly.[10] The first meeting of the examiners took place just before the first teachers' examination in November 1859.[11] The status of the Examiners was undoubtedly one of the chief reasons

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1 <u>D.S.A. 22nd Report</u> 381-382 and <u>23rd Report</u> 1
2 Table IV
3 <u>D.S.A. 24th Report</u> 37
4 <u>D.S.A. 22nd Report</u> 11
5 <u>D.S.A. 23rd Report</u> 11
6 <u>D.S.A. 28th Report</u> 85
7 <u>D.S.A. 36th Report</u> ix
8 Chapter V Section (c)(i)
9 Table XIV A
10 <u>R.C.S.I.</u> Appendix (Memorandum of 6 March 1869)
11 Cole <u>MS</u> Diary 8 November 1859

for the general acceptance of the system. "Men among the most eminent ... should hold such posts", Buckmaster was told when he was refused such an appointment.[1] Of fourteen Examiners listed in 1871[2], eight were Fellows of the Royal Society, eight were Professors or lecturers at Central Institutions, and eleven eventually attained mention in the Dictionary of National Biography.

The setting and marking procedure was carefully laid down.[3] The Examiner set the papers and gave precise instructions to his assistants, whom he nominated[4], and who were expected to mark a thousand papers each at a rate of twelve papers an hour, for which they received a payment of 1/- per paper. There were meetings for standardisation, and Examiners re-marked 20% of all papers, and all Honours papers. Papers were numbered, not named, and results were confidential. A General Conference of Chief Examiners was held, at which suggestions could be made. (This was "preferable to a special board of illustrious men who would be an impediment to business"[5], although such a Council, to advise the executive, was suggested by Roscoe.[6]) Speed of marking was of the essence when teachers waited eagerly on the results for their payment, and on at least one occasion Huxley, who examined from the scheme's inception until 1890[7], gave them precedence. "The Royal Commission can get on very well without me ... I am at work on examination papers all day", he said.[8]

The best examiners often had to be persuaded to continue, but "on the rare occasions when they did not do the job properly, they were not asked to mark again".[9] (When one Examiner, Dr. Lankester, was replaced, he was told that "appointments are not permanent".[10]) It is not perhaps surprising that the Examiners believed that the system was "productive of much good": 14 of 16 so replied to a Circular in 1871.[11] From 1864 Examiners' comments were annually published in Reports, as a guide to teachers and students. "It is of greatest value if criticism is expressed in the sternest way", emphasised Donnelly.[12] As will be detailed, the pre-eminence in their fields of the Examiners was used as an argument by officials for the continuation of the examinations system in preference to the introduction of "full inspection".[13]

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1 MS.M 12.6
2 D.S.A. 19th Report 39
3 R.C.S.I. Appendix IV (Instructions to Examiners) Science Form 341
4 Ibid. I xxii
5 S.C.S.I. AA. 39 and 339 (Cole)
6 R.C.S.I. A. 7436
7 D.S.A. 37th Report xiii
8 MS letter Huxley to Tyndall 4 June 1872
9 S.C.S.I. A. 238 (Cole)
10 MS.M 18.196-197 (Lankester)
11 R.C.S.I. I Appendix IV
12 D.S.A. 18th Report 50
13 Chapter X Section (c)(iv)

(f) Abuses of the examinations system

i) The question of "cram"

The dangers of "cram", and the possibility that question papers would be seen, and students "coached" in answers before the questions were answered, were the two great weaknesses of the system. "The cultivation of the memory rather than the intelligence" was officially deplored,[1] and Inspectors' and Examiners' Reports refer continually to its practice, as did the Department's detractors.[2] Most Examiners believed that it was possible to detect such practices in answer papers,[3] and the Department firmly instructed them to reject all papers where there was such evidence.[4] It was "not the stupidest but the cleverest (sic) teacher" who was "the best crammer ... the ignorant has his pupils rejected ... the clever crammer's art is to combine real information with a mass of undigested fact, which it is difficult to detect", Donnelly believed, after he had caused a special survey to be made. "Good and bad teaching" was "evenly divided" between those who had qualified before 1866, on the special teachers' examination, and those who possessed merely a pass in an "ordinary" examination. He hoped that adults would "refuse to pay fees and put up with cram solely for the benefit of the teacher".[5]

The regulation that Elementary papers must be passed before the Advanced papers were attempted, and the setting of compulsory questions,[6] together with improvements in the provision of "practical" facilities and better systems of teacher training, all tended to reduce the practice. Inspection by qualified persons who could use the techniques of the "viva" had to wait until the qualified people, and the financial support, were available.[7] "Whether the system is useful, or a gigantic job, depends on whether the examiners do their jobs or not", ... "the examinations are the keynote of the whole system", believed Huxley, and he added that he "would not flinch at plucking a whole school ... where the pupils are crammed like turkeys".[8]

One of Huxley's "clever fellows"[9] who found it possible to "cram" and to avoid detection was H.G.Wells, who entered the Normal School in 1883. When

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1 D.S.A. 17th Report 57
2 Hd. CXCVIII (1869) 159 (Samuelson) and R.C.S.I. XXV and A. 6129 (Sales)
3 Fourteen of sixteen Examiners, in reply to a Circular (R.C.S.I. Appendix IV) Ibid.A.265 (Huxley) A.4937 (Thompson) and Nat. 10 November 1887 (Hele Shaw, a Liverpool University Professor and Whitworth Scholar. He added that "marking examination papers is not an experience a rich man would indulge in")
4 Science Form 341 (RCSI. Appendix IV)
5 D.S.A. 18th Report 51.52
6 D.S.A. 16th Report 65 and 22nd Report 7
7 Chapter X Section (d)
8 R.C.T.I. AA. 2987, 2996, 3007 and 3013
9 Ibid. A.2987

he was an assistant teacher in a private school "the Head formed classes for my special benefit ... they were bogus classes ... in some subjects he knew little or nothing, and in none did he do any actual teaching ... the practice was for me to get a good text-book ... I passed these examinations with such a bang that I was blown out of Midhurst altogether" he said.[1] "All my studies had hitherto been second, third and fourth hand ... I had read and crammed text-books", he went on.[2] The practical work, and above all, the teacher, Huxley, discovered by Wells at the Normal School, came to him as a revelation.

"The vicious habit of cramming without understanding is becoming extinct", Donnelly claimed in 1874, and he quoted with approval Examiners' Reports which showed " a decided improvement in the quality of the instruction given".[3] There was a relative silence on the topic for several years. As general facilities improved, and as "basic" education in the elementary schools became more sound, however, criticism swelled to the point where the whole system was swept away.[4]

ii) <u>The question of "security"</u>

For the security of the examination papers, and the certification that the requisite number of classes had been held, much depended on the co-operation of the Local Committees. While a tribute to their zeal could be paid,[5] there are frequent references to irregularities. In some cases, "Secretaries" were students[6], and teachers were allowed to be present in the examination room and work out parts of answers which were passed on to students.[7] "Copying" was frequently detested.[8] Conditions in Ireland were particularly bad. The country "lacked interested gentry and had to rely on artisans" (as members of Committees.)[9] The point was eventually reached where examinations there were handed over to the Commissioners of National Education (the "primary" department under the Lord Lieutenant), and grouped in special centres.[10] Even this was not sufficient, and the Department had to refuse applications to conduct classes to such an extent that there was a reduction of 40% in the total of Irish classes.[11]

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1 H.G.Wells <u>An Experiment in Autobiography</u> (London Gollancz 1934) I 173-4
2 Wells <u>op. cit.</u> I 199
3 <u>D.S.A. 22nd Report</u> 6 and 383
4 Chapter V Section (c)(iv-vi)
5 <u>D.S.A. 17th Report</u> x
6 <u>MS.M</u> 17.35
7 <u>D.S.A. 18th Report</u> 79
8 <u>Ibid.</u> 79-81, <u>MS.M.</u> 20.27 and <u>P.M.</u> 1864-1873
9 <u>D.S.A. 8th Report</u> 85
10 <u>D.S.A. 18th Report</u> xi
11 <u>D.S.A. 22nd Report</u> 380-383

The usual punishments appear to have been the cancellation of teachers' certificates,[1] or the with-holding of payments,[2] or "passing with a caution".[3] There were reminders that papers must not be opened before the examination and that "in cases of enquiry students must tell what they know or be refused permission to re-sit".[4] The "administrative" role of the Inspectors entailed their presence at examinations as one of their chief functions, but the limited numbers of these officials caused the appointment of officers of the Royal Engineers, whose chief duty for many years was to "check examination procedures".[5] In an endeavour to systematise still further, the amalgamation of classes in local centres was encouraged from 1870[6], and made compulsory from 1871.[7] "Local Secretaries" were appointed and paid special expenses for their duties in this connection.[8] A threat still had to be made in that year, however, that in cases of "fudging" traceable to lack of care by a Committee, all the examinations in their School would be cancelled, and the Committee reorganised.[9] As a result of all these measures, cases of irregularities show a relative decline from 1867.[10]

The outstanding examples of fraud involved in the examinations came with the "Goffin Case" in the 1880's. It is treated in detail later,[11] but it exposed a major weakness in the Department's system, and led to the adoption of measures designed to reduce the possibilities of "fraudulent interference". The most important of these was an arrangement whereby papers were timed to arrive by the very last post before the examination. It says much for the postal services of the late nineteenth century that only three of a total of over five thousand packets posted for the 1884 examinations were delayed in the post: another five were not delivered on time for other reasons.[12] By 1888, even the Engineer could say that the Department's "security" was "beyond reproach", and it praised its "commercial" side for its efficiency.[13]

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1 P.M. B 2.107 (1867) etc.
2 Ibid. B 2.30, 37, 39, (1867) etc. and MS.M. 17, 35.
3 Ibid. B 2.262 (1867) etc.
4 D.S.A. 15th Report 1
5 Chapter X Section (b)
6 D.S.A. 17th Report 47
7 D.S.A. 18th Report 30
8 D.S.A. 19th Report 7 and 9
9 D.S.A. 18th Report 33
10 Printed Minute lists refer to specific cases of irregularity as follows:-
1867 examinations - 10 1868 examinations - 9 1869 examinations - 7
1870 examinations - 5 1871 examinations - 5
There was a slight increase in totals (which never exceeded 10) in the 1870's, but this was really a relative decline, because of the great increase in the numbers of classes.
11 Chapter XI Section (h)
12 D.S.A. 31st Report 61
13 Engr. 27 July 1888.

g) The Science subjects: "Pure" or "Applied" ?

i) Basic premises

From the outset of the 1859 scheme, the "subjects" which the Department was prepared to encourage were seen as basic to an understanding (and improvement) of industrial processes, but not necessarily as directly applicable to "any trade or industry". (This was, in effect, a continuation of the debate on the real purpose of the School of Mines). "Technical instruction", Cole believed, involved "the teaching of the principles of various sciences applicable to industry".[1] There were some subjects which could be regarded as "technological" (Steam, Nautical Astronomy, the group of Building subjects, Mining and Metallurgy and later, Agriculture) but most of the instruction remained "pure" rather than "applied".

While Donnelly in the earliest days of the scheme made a proposal for a differential scale of payments, to encourage the teaching of the more "technical" subjects, this was turned down.[2] The same payments were made on all subjects, and there was equality of standards between papers.[3] All the subjects had "a bearing on industrial occupations";[4] the Drawing and Building Construction subjects were "the very foundations of technical instruction";[5] and "trade would be seriously affected if instruction were not given",[6] argued officials. The Samuelson Committee did not agree: the teaching, it believed, was "rudimentary ... with very little direct influence on the industrial occupations of any class".[7]

ii) Reasons for reluctance to aid "trade teaching"

Fear of Parliamentary opposition if "the state" appeared to be subsidising trade instruction, and reluctance to develop this aspect because of the great complexity of having to set, and examine, papers in a multiplicity of trades, were probably dominant considerations. "It cannot be considered a function of the State to teach a trade", it was said when Navigation Schools were charged with "cramming" adults for Board of Trade Certificates, in competition with private schools.[8] "Trade teaching, save in the School of Naval Architecture", was strongly opposed by Cole[9] (who had of course argued

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1 S.C.S.I. A.301
2 MS.M 17.50a
3 S.C.S.I. AA. 64, 66 (Cole)
4 Ibid. AA. 64, 111 (Cole)
5 Ibid. A. 666 (Donnelly) A. 1411 (Iselin)
6 Ibid. A. 567 (Donnelly)
7 Ibid. iv
8 D.S.A. 10th Report 36-37
9 S.C.S.I. A.309

equally strongly before 1852 for instruction in technical processes and virtual trade teaching of designers and craftsmen.) "State aided workshops" were categorically objected to by Donnelly, who believed that "the State should assist manufacturing students just to the point of learning a trade".[1] Despite these objections, Donnelly was the originator of schemes of "technological" instruction which were aided by private sources and were designed to supplement the Department's work, as has been recorded.[2]

iii) Criticisms of the "pure" teaching

Certain bodies, however, carried on "technical" schemes in conjunction with classes promoted by the Department. The Amalgamated Society of Carpenters organised such classes from 1861.[3] The Reverend Henry Solly's Trade Guild of Learning had classes in Bricklaying and in Carpentry which were based upon "Department" classes in Practical Geometry and Building Construction.[4] "South Kensington" was "training pupils to be architects rather than workmen", believed one of Solly's artisans, and he wanted classes where the "manipulation of material" was involved.[5] In Solly's opinion, "working men are decisively against the Department's classes, as they are too abstract",[6] and he quoted "workmen who use the term 'a South Kensington certificate' as an expression of contempt".[7] A memorandum from the Trades Guild in 1878 brought the reply, signed by Macleod, that it has "not hitherto been a function ... to teach the practical applications of Science and Art to industry ... but to leave the student to specialise his knowledge in the workshop or trade." He doubted if there was any Parliamentary sanction for "trade" classes: he admitted that Building Construction, Mechanical Drawing, Mining, Metallurgy, and Agriculture involved a "more general application of science to industry", but stressed that "the broad principles only of industry are treated".[8]

This refusal to aid "trades" classes was upheld by two influential witnesses before the Technical Instruction Commission,[9] and Donnelly devoted

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1 S.C.S.I. Appendix XI and A.313
2 Chapters III Section (e)(iii), IV Section (f) and V Section (d)(vi)
3 S.C.S.I. A.1956 (Applegarth) and A.W. Humphrey Robert Applegarth (Manchester and London National Labour Press 1913) 192-196
4 C.T.Millis Education for Trades and Industries (London Arnold 1932) 28. (Millis, then a metalworker, was a witness before the Technical Instruction Commission).
5 Henry Solly Technical Education (London Stanford 1878) 9-11
6 Henry Solly The Trades Guild of Learning (London Kent n.d.) 9
7 Solly The Technical Education Report of the Royal Commissioners N.C. August 1884.
8 Solly Technical Education 23-24 and C.T.Millis Technical Education (London Arnold 1925) 29-30
9 R.C.T.I. A.532 ("It is not the business of the government to teach manufactures":Curzon of the Yorkshire Union). A.3005 ("It is not the duty of the employer to give technical education":Huxley).

part of his testimony to a defence of the position taken up by the Department. He believed that the Department should go as far in "technical" matters as was "expedient", but would draw "no hard and fast line". He pointed out the failures of the experiments in Art, and said that these had usually been undertaken when the industry which was to be encouraged was in a "decayed state". He said that he had found on his journeys in the North, in particular, that workmen were generally keen on technological classes, but that employers opposed their development because they feared the loss of "trade secrets". Even if Parliament agreed that such classes could be aided, there would be "the further difficulty of holding the balance between applications from different industries". He reiterated his belief that "Scientific instruction is principles not practice". He ended with a shot at the Department's critics, by saying that if such instruction had been given from the outset "it would have been one more stone to throw".[1] When the Commission queried the "trade" implications of the Art classes, Donnelly said that the "principles of Art" were "applied only broadly to Design ... not to the precise or technical stage".[2]

In 1878, a later pillar of the City and Guilds movement attacked the Department's system as "cramping the attempts towards a more practicable system".[3] Another member of the movement later queried Donnelly's contention that the Science classes restricted themselves to "principles", saying that classes in Agriculture, Mining, and Nautical Astronomy, for example, were "trade classes", and that "the Department would have departed even further from its principles" if his own movement had not "stepped in".[4] "The circumstances of the country at the time enforced them", Huxley believed, but he added that he, personally, would not have started such classes.[5] In actual fact, these "applied sciences" up to this point had been the least popular of the Department's classes, partly because the industries to which they could be applied were of less importance, partly because they were too specialised for the "general student", but chiefly, perhaps, because the teachers to undertake them had to be highly skilled and were also in short supply. In January 1877, while there were 539 classes with 11,771 students in Practical Mathematics, and 334 classes with 7,845 students in Practical Geography, throughout the

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1 R.C.T.I. AA. 2865-2872
2 Ibid. A.2845
3 N.A.P.S.S. 1878 Report 100 (Sylvanus P. Thomson)
4 R.C.T.I. A. 4525 (O. Roberts)
5 Ibid. A. 3003

country, the least popular subjects were Nautical Astronomy (10 classes with 290 students), Naval Architecture (10 and 198), Mineralogy (12 and 161), Mining (13 and 337) and Metallurgy (15 and 218).[1]

iv) The continued debate

It was the contention of several witnesses before the Technical Instruction Commission that the study of "abstract principles" was of little value to industry.[2] The Commission did not believe that workmen in general appreciated the need for such study.[3] (An artisan witness called the Department's subjects "utterly valueless".[4]) Nineteen of 49 employers, in reply to a Circular, said that their workmen were "indifferent".[5] Some manufacturers who gave evidence believed that "basic" knowledge was necessary and valuable,[6] but there was a dispute over the place where it should be studied. Some were strongly in favour of "technical classes",[7] while others felt that the best place to learn technical applications was the factory floor.[8] A City and Guilds lecturer thought that "principles" could be taught through trade teaching, with no need at all for "abstract" study.[9]

Outside the Commission, there was a division of opinion,too. The "Department" classes "stopped at theory, with no practical applications" and thus "provided students with tools they will never use," argued the Engineer,[10] while Engineering saw the Department's classes as "terribly learned" and insisted that "practice must be left to the workshop".[11] "Instruction more applicable to local industries" was demanded by the Clerk to the Sheffield School Board.[12] Nature, however, pleaded for the inclusion of "pure science" in the curriculum of a projected Tees-side Technical School, saying that such studies were essential.[13] "Rudimentary" science instruction was the basis of all Technical Instruction, agreed Rigg, a former Training College Principal and co-operator in an unsuccessful scheme to train Science teachers in the Department's early days.[14] Huxley was once again a great champion. "Technical Education without instruction in the unpractical branches would be a snare and

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1 D.S.A. 24th Report 53
2 R.C.T.I. A.746 (Reynolds), A.3927 (Hopps) A.4201 (Woodward)
3 Ibid. Second Report III 523
4 Ibid. A.2385 (Channon, bricklayer)
5 Ibid. III Appendix III
6 Ibid. A.250 (Lowthian Bell) A.219 (W.H.Perkin) A.627 (Gee) A.756 (Reynolds) A.776 (Rawle)
7 Ibid. A.198 (Perkin) A.762 (Reynolds) A.2124 (Solly)
8 Ibid. A.926 (Wedgwood) A.304 (Bell) A.1807 (Anderson)
9 Ibid. A.1278 (W.E.Ayrton)
10 Engr. 5 February 1875 and 10 June 1881
11 Engg. 15 December 1878
12 Br. Assn. 1879 Report (T.F.Moss)
13 Nat. 10 August 1882
14 N.A.P.S.S. 1876 Report 101

a delusion", he said.[1] "Science Schools were not meant to teach people to saw ..." The Department had "enough to manage with the provision of basic scientific instruction".[2] Before the Technical Instruction Commission, he was "strongly against the study of merely practical applications", and believed that it would be a mistake "to alter the Department's syllabus" (sic) to "induce artisans to believe that any less knowledge was necessary as a basis of their trades".[3]

As has been recorded, a hoped for solution to the debate was found in the development of a technological examinations system which was a consequence of the Technical Instruction movement, supported by the City and Guilds of London, and the Department's examinations were initially linked with these schemes.[4] This did not still criticism. The view that "knowledge is a thing worth having in itself" was attacked by Engineering. It demanded "more teaching of useful knowledge, or 'Made in Germany' will be writ even larger on our national life".[5] Strong arguments for the study of "principles" were put forward by Donnelly,[6] and by Playfair.[7] Playfair's speech brought a violent attack from the Engineer.[8] It was necessary for the defence to be offered that the London Polytechnics were "teaching knowledge for its own sake as well as for utility".[9]

v) Attempts to still criticism

The Metallurgy Syllabus was "completely recast ... for greater value to local industries" in 1886,[10] and by 1889 one periodical could say that an examination of question papers of the last ten years showed "how practical the questions have gradually become".[11] The Department's subjects were now "distinctly technical in character", Roscoe believed in that year.[12] Theory must be related to practice, or it encouraged "merely superficial education", William Garnett argued, but he dismissed much of the Department's work as doing precisely this, however.[13] The improvement was claimed to be entirely due to

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1 Nat. 10 August 1882, quoting a letter by Huxley to The Times
2 Engr. 3 December 1879 (Paper at the Society of Arts)
3 R.C.T.I. AA. 3001, 3069
4 Chapter IV Section (f)
5 Engg. 24 November 1893
6 Nat. 29 November 1894 (Speech at the Society of Arts)
7 Br. Assn. 1885 Report (Presidential Address)
8 Engr. 11 September 1885
9 Engg. 25 September 1896 (Letter by the Principal of the Battersea Polytechnic)
10 D.S.A. 33rd Report 42
11 S and A April 1889
12 Nat. 26 December 1889
13 Engr. 25 October 1889

the efforts of his National Association by Lord Hartington, who said that before they applied their influence the Department had "made scarcely any efforts to teach practical applications".[1]

There could be no criticisms levelled at the Department on its attitude to "practical applications" after the local Councils were given the power to use the Whisky Money after 1890. The subjects the Department sanctioned as "Technical Education" were in the main avowedly "practical", and the explanations of its criteria in the consideration of applications for approval have also been recorded, as has the willingness to "assist subjects not in the Directory" by the provision of a special fund.[2] It must of course be stressed that its own examinations continued to be "technical" rather than "technological" in their intent. "There is a strong feeling in the Treasury, our paymasters, that the Department should not pay for applied teaching in science ... all our subjects are pure Art or pure Science", said C.A.Buckmaster in 1895, but it is significant that he added "or they used to be".[3] The Department had had to "go as near the wind as possible" to make the 1889 Act work at all, believed a Peer.[4]

Care was, however, needed even in this development that other vested interests were not offended. The "teaching of trades" would "bring the authorities into collisions with workmen and their Unions", warned the Lord President, Cranbrook,[5] and the Department stressed that entries to classes such as Practical Plumbing and Carpentry "must be restricted to apprentices or the sons of craftsmen ... as it is not their function to teach trades".[6]

The Department was still, in the view of one critic, "a modern Circumlocution Office ... with the motto 'How not to do it' ... its efforts in the field of applied science ... make it the laughing stock of practical men" but since he was arguing for the concentration of resources in institutions such as his own, he could not be seen as entirely disinterested.[7] It would appear that by the end of its career, the Department had succeeded in pleasing most parties in this field, at least.

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1 Nat. 8 July 1891
2 Chapter V Section (d)(vi)
3 R.C.S.E. A. 10441
4 Hd. I (1892) 420-421 (Cowper)
5 Ibid. 431
6 D.S.A. 42nd Report lxiii
7 Engr. 1 October 1897 (Professor J.O. Arnold of Sheffield University)

h) The encouragement of practical work

"Equipment" grants were made from the inception of the 1859 scheme, but expendable material was expressly excluded from its provisions.[1] The encouragement of such work was obviously one way to reduce the effects of "cram". The means by which this was done afford a good example of the use of the "results" machinery. Questions which were designed to require "first hand knowledge" were made part of examinations in Chemistry from 1871, as has been noted.[2] At the same time, a grant was allowed on "expendable" items.[3] The British Association were very much in favour of such activities,[4] Playfair was a strong advocate[5], and Whitworth made an examination in practical techniques part of his scholarship scheme, as will be recorded.[6] The provision of facilities for such work was encouraged by a higher scale of grants from 1871,[7] and Hofmann, after he returned to Germany, offered "every assistance with the planning of laboratories".[8]

While a plea for instruction in "practical anatomy"[9] met with no response, there was a call for the extension of the examination of "practical" knowledge to examinations in Physics.[10] The matter was discussed before the Technical Instruction Commission. "The time has come for the Department to put the screw on and make practical work essential", thought Huxley,[11] and while other witnesses were in favour of extension, the question of expense was also raised.[12] A suggestion which he had made some years before for a compulsory practical examination in all Honours papers had been refused by the political chiefs on these grounds, said Donnelly.[13] The Department did, however, form a loan collection of apparatus.[14] In 1877 the regulations were revised to make grants on work in Practical Chemistry dependent upon the provision of good laboratory facilities, while no classes would be examined in Physics unless the school provided "apparatus for some of the more important

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1 MS.M 13.59
2 Section (d)(ii)
3 D.S.A. 18th Report 20
4 Ath. 13 June 1868
5 N.A.P.S.S. 1870 Report 331
6 Chapter XII Section (d)(ii)
7 D.S.A. 19th Report 17
8 MS letter Hofmann to Cole 20 September 1868
9 N.A.P.S.S. 1877 Report 211 (J.M. Struthers)
10 Nat. 13 April 1882
11 R.C.T.I. A.3000
12 Ibid. A.709 (Reynolds) A.2039 (Kennedy)
13 Ibid. A. 3592
14 D.S.A. 23rd Report xv

experiments", and the teacher "might be called upon to show his ability to perform some of them".[1] A practical examination was added to the examination in Physics in 1882[2], in Metallurgy and in four Honours subjects in 1883, and in Mineralogy in 1884.[3] Although,as has been recorded, the support offered on the construction and equipping of laboratories was eventually withdrawn, to throw the burden on the suddenly prosperous Councils,[4] the Department continued to insist on well-equipped laboratories as a condition of grant on examination results, especially in the Organised Science Schools.[5] The better schemes of teacher training which developed in the last years of the century encouraged more "practical" work,[6] and it is significant that Practical Chemistry, which became a "subject" in its own right,[7] was soon one of the most popular subjects.[8] Organic Chemistry, too, had its own practical examination[9], but this was less popular, as was the "theory" paper.

i) The development of day Science Schools from 1859

i) The "remnants" of the old system

Difficulties with the Education Department, a lack of demand from middle-class parents, and the problems of competition with the labour market for boys of school age[10], all militated against the rapid growth of full-time schooling in science. The only Trade School to survive, and flourish, was at Bristol: a special "elementary school" was set up to feed its classes,[11] its students received four of the eight gold medals awarded nationally in 1868[12], and it eventually became a centre of "technical instruction" for its area.[13] (In 1885, it formed the nucleus of the Merchant Venturers' Technical College.)[14] There were "not more than twenty day schools in the country connected with the Department" in 1868,[15] and many of these were "Navigation Schools", which were fairly soon to leave the Department's control.

A special investigation into the problems of these Schools was carried out by Donnelly, and he and Ryder, the Inspector, recommended capitation

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1 D.S.A. 25th Report 2-3
2 D.S.A. 30th Report xxxv
3 D.S.A. 33rd Report x
4 Chapter V Section (c)(iii)
5 Engr. 16 April 1897
6 Chapter XI Sections (d) and (e)
7 D.S.A. 27th Report 9
8 Table XIV A
9 D.S.A. 39th Report 41
10 S.C.S.I. AA. 3808 and 3813 (Coomber)
11 R.C.S.I. A. 6346 (Coomber)
12 D.S.A. 13th Report 47
13 Cole MS Diary 9 and 10 January 1868
14 Cottle and Sherborne The Life of a University (Bristol Arrowsmith 1951) 1
15 S.C.S.I. A. 6480 (Donnelly)

payments, despite the normal objections of the Department to such a method, to overcome the problem of migratory pupils and to encourage "consistent application."[1] After a second investigation in 1863,[2] Donnelly noted that "the number of boys going to sea is insignificant", and that "cramming" of seamen for Board of Trade certificates in competition with private teachers, seemed to be the Schools' main concern. It was unreasonable, he felt, to pay large fixed salaries to teachers for work which was elementary or was "trade teaching". Payment of teachers was therefore restricted to "science subjects".[3] "Remonstrances" from teachers followed[4], and most of them left to earn a living as private "crammers" of seamen.[5] "Mr. Lowe did not care to preserve the Navigation Schools"[6], and they were handed back to the Board of Trade in 1865, although masters could still earn payments on results on the science subjects.[7] A suggestion that they should be taken over once more, and that all the Board of Trade examinations should come with them[8], was ignored: this was one field in which the normally acquisitive Department had had enough.

ii) <u>The problem of the creation of day schools</u>

Before the Samuelson Committee, Cole argued that it would be wrong for government "to build schools ... and await for the demand to fill them",[9] and Donnelly stressed the need to develop a scheme of publicly subscribed Exhibitions to support the students.[10] "High class science schools" were strongly recommended by one witness[11], but an experienced and successful teacher doubted their immediate success.[12] Before the Royal Commission which succeeded the Committee, Cole outlined a scheme which would "draft the best children to secondary instruction", and said that he "expected a higher grade of school" to develop, "with children staying to 15".[13] The "chance of systematic work would be best in science secondary schools" and "evening work would perforce remain casual", Donnelly thought.[14] The Commission recommended the setting up of "superior Science schools" as centres of groups of "elementary Science schools".[15]

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1 <u>D.S.A. 8th Report</u> 17
2 Cole <u>MS</u> Diary 17 February 1863
3 <u>D.S.A. 10th Report</u> 36-37
4 <u>D.S.A. 12th Report</u> viii
5 Bartley <u>op. cit.</u> 170
6 Cole <u>MS</u> Diary 5 February 1864
7 <u>D.S.A. 13th Report</u> 46
8 <u>N.A.P.S.S. 1870 Report</u> 336 (Rev. R.Hooppell)
9 <u>S.C.S.I.</u> A. 906
10 <u>Ibid.</u> Appendix XI
11 <u>Ibid.</u> A. 5167 (Watts)
12 Ibid. A. 4529 (Jarmain)
13 <u>R.C.S.I.</u> AA. 193, 198 and 5955
14 <u>Ibid.</u> AA. 6482 and 6486
15 <u>Ibid.</u> Second Report I xxviii

There was an attempt to encourage the development of systematic "grouped" courses, in day or evening schools, from 1871, to which reference has been made[1], but this was "not much taken advantage of" at first.[2] The absence of "middle class" support was understood by the Department.[3] In effect, the only day schools in existence which could be aided by the Department so long as the ban on the encouragement of "Education Department" schools remained, were the Endowed Schools: the regulations of the Department allowed some aid, but limited grants to schools where fees were low enough to permit "children of manual workers" to attend, and where local subscriptions were at least equal to the amount of the grant.[4] Aid in the purchase of apparatus and experimental material was allowed from 1879.[5]

Calls for "good science schools" continued,[6] but met little response, despite the Department's efforts. The Technical Instruction Commission commented on the lack of progress, and repeated the need for "good modern Science Schools as providing the best means of preparation for further technical studies".[7] The Department began to use the name of "Organised Science Schools" for day (and evening) schools which grouped their courses in the way encouraged by the 1871 regulation. In 1874 there were five such schools[8]: an additional school was set up in 1875[9], and the number remained at this figure eight years later.[10] The Department's aid with scholarship provision, although this could be denounced as "a mere palliative"[11], was meant to encourage a longer period of preparation in elementary schools and to provide some support in maintenance at the "Organised Science School". The "want of effort" on the part of local authorities was shown by the low numbers of scholarships which were granted.[12]

iii) <u>The growth of schools "outside" the Education Department</u>

When Iselin recommended a restriction on the entry of children from evening classes in 1873, he shrewdly, and correctly, predicted that this would lead to the development of "upper standards" as Science Schools.[13] Much of the credit for the later growth of day schools was claimed by Abney[14], but the real

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1 <u>D.S.A. 19th Report</u> 25-27 and Section (d)(ii)
2 <u>D.S.A. 20th Report</u> 40 and <u>22nd Report</u> 383
3 <u>D.S.A. 18th Report</u> 33, 48
4 <u>D.S.A. 16th Report</u> 48
5 <u>D.S.A. 26th Report</u> 2
6 <u>Engg.</u> 23 September 1876
<u>Engr.</u> 23 March 1877
7 <u>R.C.T.I.</u> 2nd Report III 516
8 <u>D.S.A. 20th Report</u> 44-46
9 <u>D.S.A. 21st Report</u> 23
10 <u>R.C.T.I.</u> AA. 3133-3134 (Abney)
11 <u>N.A.P.S.S.</u> 1878 Report 101 (H.M.Jeffery)
12 <u>D.S.A. 21st Report 26</u> and Table XLVI
13 <u>D.S.A. 21st Report</u> 23
14 <u>R.C.S.E.</u> A.1243

causes were an increased demand for further education after the passing of the 1870 Act, a greater supply of funds with the achievement of the "Whisky Money",[1] and the need for more skilled scientists and technicians as industry grew more complex. The continued lack of co-operation offered by the Education Department meant that it was the Organised Science Schools encouraged by the Department which met the need, not only for science teaching, and the difficulty in distinguishing between "secondary" and "technical" education was one consequence. In the desire to obtain financial aid, there was relative silence for a long period on the basic point that its scheme of science teaching from its inception had been based on "instruction rather than education". The syllabuses, as laid down in the Directory, were really designed for such instruction which would have "industrial applications" in weekly lessons carried on, and examined, in the evenings, for young adults. The views expressed by manufacturers who favoured "education rather than information",[2] and the British Association Committee on the Teaching of Chemistry, who wanted "mental education based on observation ... with learners put in the place of discoverers",[3] gained increasing support in the last decade of the century.

Such Endowed Schools as were not limited by the terms of their endowments[4] could benefit by the Department's grant system subject to certain provisos, as has been recorded. In reporting a scheme whereby the funds of the Charity Commissioners could be, in some measure, devoted to Technical Education, Engineering said with great truth that the position was "extremely diffuse".[5] In cases where the Department was asked to give rulings on the application of Whisky Money to their aid, the decision in most cases was that such help could be given.[6] By 1897 the Department reported that "many authorities" were "giving liberal aid to these schools"[7] they represented approximately 30% of the total of Science Schools in 1898.[8]

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1 Chapter V Sections (d)(v) and (h)(iii)
2 Results of an enquiry organised by the Technical Education Board of the L.C.C. 1888. (C.W.Kimmins The Teaching of Science in Schools in [ed.] R.D.Roberts Education in the Nineteenth Century [Cambridge University Press 1901] 127)
3 Br. Assn. 1889 Report (One can trace here the "heuristic" views of Rutherford, one of the members of the Committee).
4 Br. Assn. 1886 Report (Dr. Crosskey)
5 Engg. 21 February 1890
6 D.S.A. 40th Report liii
7 D.S.A. 44th Report x
8 D.S.A. 46th Report v

The details of the curriculum of the Middlesbrough Boys' High School, for the Academic Year 1889-1890, give an indication of the kind of work which was followed by the children in such a school.[1]

	Hours of instruction per week		
	First Year	Second Year	Third Year
Mathematics	5	5	5
Drawing	5	3	-
Inorganic Chemistry	5	5	9*
Physics (including Sound Light and Heat and Electricity and Magnetism)	2	2	9*
Mechanics (including "Steam" and Machine Construction and Drawing)	-	4	9*
French	5	5	4
Latin or English	5	5	5
Scripture	1	1	1
Geography	2	-	-
"English subjects"	-	-	5
Animal Physiology	-	-	1

This was not an extreme case: it could, in fact, have been argued that this was a rather more "liberal" curriculum than that followed in many schools. (The School was itself a recent growth in a town where the demands of industry had always bulked large: the ease with which it had become a Science School was due to the fact that it was not of the more traditional kind which was, in Morant's words, "associated in the minds of everyone with a higher social class".[2])

iv) Criticisms of the curriculum

The narrowness in the curriculum of the Science Schools had been criticised as early as 1883: it was "one-sided, and Languages and History particularly needed encouragement".[3] (This was later to lead to an accusation that science was "bounty-fed" at the expense of other features of a wider

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1 Prospectus of the Middlesbrough Boys' High School 1889-1890 (* One only of these subjects was taken).

2 E.J.R. Eaglesham From School Board to Local Authority (London Routledge and Kegan Paul 1956) 188

3 N.A.P.S.S. 1883 Report 216 (F.J.Richards)

education.[1]). A further matter for criticism was the fact that the income of the Schools depended to a very great extent on payments on results, so that the opportunities of divergence from the subject syllabus of the Directory would be few. Payments, which could be based on capitation, were increased in 1891[2]. The Department claimed that it was fully aware of the dangers of neglect of non-grant earning subjects, and it took the initiative by calling an inter-Departmental Conference with the Education Department and the Charity Commissioners to discuss ways in which the Schools could be encouraged to avoid being "merely grant earning bodies".[3]

The outcome was the promulgation of new Rules for the conduct of Organised Science Schools in November 1894, and it was announced that grants would be "awarded more largely on inspection and less on examination". The weekly lower limit for Science instruction was lowered to 13 hours, and it was ordered that not less than 10 hours a week should be devoted to other subjects, of which two hours a week had to be given to Manual Instruction.[4] The changes had come too late to stem the almost universal criticism which was levelled at the Department before the Secondary Education Commission. Before it met, the old Normal School student, H.G.Wells, had added his comments in an article in Nature, wherein he said that it was time for the Department to withdraw entirely from day schools, since "its examinations require identification rather than interpretation ... and its methods follow the pattern, lecture, text-book, diagram".[5] The Headmaster of a Higher Grade School, in reply, said that the abolition of second class payments was actually encouraging cram rather than the reverse, that "schedules" were designed for adult instruction, and that literary subjects were "suffering". The examinations, he believed, were "educational abominations", but to suggest that the Department should withdraw was "impossible".[6] This had merely endorsed his accusations, said Wells, and made the case for withdrawal more obvious.

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1 C. Brereton, The return on Secondary Education in the light of proposed legislation F.R. July - December 1898 N.S. LXIV 765-777
2 D.S.A. 39th Report 1
3 D.S.A. 41st Report lxiv
4 D.S.A. 42nd Report ix and 5
5 Nat. 27 September 1894
6 Ibid. 15 November 1894 (W.B.Crump, of Halifax)
7 Ibid. 29 November 1894

v) General criticism of the system

Witnesses before the Secondary Education Commission assailed almost every aspect of the Department's administration. Grants were seen as a necessary evil,[1] but the regulations which controlled their award were detested. The syllabuses were not designed for children,[2] payments on results encouraged cram[3], and the "neglect of the dull".[4] Evening examinations were particularly bad for children.[5] Non-examined subjects were perforce neglected.[6] When the demands of other bodies were taken into account, the result was a "multiplicity of examinations".[7]

In defending his Department on the question of curriculum, Donnelly stressed that no Inspector could cover both Science and Literature[8]. (His defence of payments on results is given elsewhere[9]). His colleague Abney admitted that there were "non-labouring children" in the Schools, and girls, too, although courses were certainly not designed for them: he was prepared to admit the possibility of an increase in capitation payments.[10] Donnelly admitted that inspection, if standardised, would be an improvement.[11] Abney agreed, but wished to retain examination for the more advanced stages.[12] Gilbert Redgrave thought that "day examinations would be possible", but pointed out the additional expense which would be involved.[13]

On the aspects under consideration, the Commission condemned "cram", believed that there had been "a concentration on grant earning subjects ... to the neglect and virtual ignoring of literary subjects", referred to "chronic examination fever", and thought that "training was one-sided and of little educational value". They admitted that the Department "had been alive for some time to these defects", and was "desirous of remedying them". They pointed out that there were "severe objections to evening examinations",

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1 R.C.S.E. A. 8369-8370 (Bidgood and Forsyth, Association of Headmasters of Higher Grade and Organised Science Schools) A.6406 (Rev. E.F.M. McCarthy, Birmingham manager) A. 8172, 8176 (Bowden and Macnamara, N.U.T.) A. 14828 (W.B.Dixon, West Riding County Council)
2 Ibid. A. 6401 (McCarthy)
3 Ibid. A. 6553 (Rev. R.Bruce, Huddersfield manager) Q.1285 (Yoxall, member and M.P.)
4 Ibid. A. 6404 (McCarthy)
5 Ibid. AA. 8299-8304 (Bidgood and Forsyth)
6 Ibid. A. 6401 (McCarthy) A. 6553 (Bruce) A. 8175 (Bowden) A. 9085-9087 (J.G. Fitch, former H.M.I.)
7 Ibid. A. 7780 (Easterbrook, Headmaster) A. 8302 (Bidgood)
8 Ibid. A. 1216
9 Chapter V Section (v)
10 R.C.S.E. AA. 1268, 1303, 1308, 1314
11 Ibid. A.1128
12 Ibid. A.1289
13 Ibid. A.10320

particularly when they were "concentrated in May".[1] Their recommendations for action which would end these "evils" were embodied in the proposals for a unified Education Department.[2]

vi) The last years of the day Science Schools

The Department made a further amendment to regulations, which permitted additional capitation payments, subject to satisfactory Inspectors' reports, while the Commission was sitting, but stressed that "such grants would be withdrawn if the May examination results showed general inefficiency". Schools could not take part payment on results, part payment on inspection, but had to choose one or the other.[3] "Proper practical work" had to be included in schemes of work which would be approved for each school, the Inspectors would give three weeks warning of their visit, and would choose the mode, viva, papers, or both. H.M.I.'s would co-operate in the inspection of "literary subjects", which had to be included in the curriculum.[4] Despite the wide-spread criticisms of the old system, Abney reported the following year that the inspection alternative had not been widely adopted.[5]

In 1896, a scheme of day examinations was at last introduced,[6] to meet the criticisms raised by the Secondary Commissioners and in the House.[7] In 1897, the Schools were officially designated "Schools of Science": there were then 156 in existence, of which 62 were higher grade schools, 55 were "endowed", and 38 were "Technical and others".[8] There was a "tendency towards an upward leaving age", and schools "continued to improve".[9] "Early leaving" caused some concern: the "question of the continuation of registration would be looked in to", it was stated, if more than 25% of pupils left after one year.[10] (One result of this injunction was that more children stayed on in Elementary Schools to receive instruction in "specific subjects".[11]) By 1898, the restriction was removed, if a one year course were followed by immediate entry to evening classes.[12]

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1 R.C.S.E. 60, 61, 79, 99, 100
2 Ibid. 257
3 D.S.A. 43rd Report 8
4 P.P. (1895) LXXVIII (400) (Rules for Organised Science Schools)
5 D.S.A. 43rd Report xx
6 D.S.A. 44th Report x
7 Hd. XX (1894) 653 Hd. XLII (1896) 1285
8 D.S.A. 45th Report xiii (There is a difference of one in the totals)
9 Ibid. xii-xiv
10 Ibid. 5
11 Nat. 8 December 1898
12 D.S.A. 46th Report v

Gilbert Redgrave could still tell an International Congress in 1897 that the "model Secondary School would have a high proportion of the students' time devoted to practical Science work",[1] and a few months after the Department ceased to exist, a correspondent in Nature complained of "over-direction" in the specification of "old fashioned laboratory fittings as a condition of grant".[2] There is little doubt, however, that the curriculum of the "secondary schools" became far less "science-dominated" after 1894, although "science" still occupied a high proportion of time. This "imbalance" could be regretted, and it would be one of the first things to be changed by Morant in the first decade of the new century. It is, however, worth re-iterating that without the Department's encouragement, the powers granted in 1902 to the new L.E.A.s to aid in the provision of secondary education would have taken longer to be used, since many of them would have found themselves without "secondary" schools on which to build.

j) The development of "evening" science schools from 1859

i) The first years of the scheme

Although there was a rapid increase in the number of "Science Schools" connected with the Department, from the inception of the "new" scheme[3], these were almost without exception "schools" in name only, consisting of little more than a room, a teacher and students: "single subject schools" formed a high proportion of the total for a long period.[4] "Much of the Department's effort was grafted on to existing institutions", believed Donnelly, and it had, therefore, not received its full share of credit.[5] Many of these "institutions" were Mechanics' Institutes. Their students often paid only small additional fees for classes.[6] 40 such institutions were connected with the Department in 1863, of a total of 95 Schools.[7] There were 143, of a total of 514, in 1869.[8] As relations with the Education Department improved, classes were set up in primary school premises, and despite the different standards of examination between the "Art" and "Science" sides of the subject, classes in the Mechanical Drawing group were set up in Schools of Art also.[9] Later, the London School

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1 Nat. 24 June 1897
2 Ibid. 13 July 1899
3 Table IV
4 Table X
5 D.S.A. 16th Report 57
6 D.S.A. 11th Report 55
7 Ibid. 27-44
8 D.S.A. 16th Report vi-vii
9 D.S.A. 11th Report 56

Board permitted the use of its premises for evening classes, "and although students had to sit at children's desks", classes were "popular".[1]

The few Schools which had existed before 1859 did not markedly prosper. The Mining Schools of Devon and Cornwall found it difficult to attract students at a time of decline in the tin industry,[2] and Cole could offer no prospect of special aid.[3] It bothered the Department little that many of the "schools" set up led only a fleeting existence. It was noted with approval, in 1864, that many schools "had already ceased to exist", as an example of the way in which "an experimental system would develop from small beginnings".[4] Classes were "sometimes ephemeral", Cole agreed in 1868, but he does not appear to have been over-concerned at this,[5] and as late as 1881 the Department admitted that "death or removal of the teacher" would close 40% of the schools.[6] There was, in fact, a gradual decline in the "closure" rate as the scheme developed.[7]

ii) <u>The need for systematic courses</u>

A matter of more concern was the "irregular and unsystematic manner" in which subjects could be taught and studied. This received attention by the two Enquiries of 1868 and 1870, and some system of "grouping" was favoured.[8] While Donnelly concurred in this, he pointed out that "adults learn what they wish".[9] He had, in fact, urged the abolition of a "grouping system" which had existed since the inception of the 1859 scheme, on the grounds that it existed only for the award of medals, and had no real significance, in 1865.[10] The regulations of 1871 which attempted to encourage "grouping" had initially little impact[11], but there was a gradual decline in the proportion of "single subject schools" as the scheme developed.[12]

The "desultory system of instruction"[13] was criticised before the Devonshire Commission: "Mathematics is followed by Botany followed by Steam",

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1 <u>D.S.A. 24th Report</u> 229
2 <u>Ibid.</u> 56
3 Cole <u>MS</u> Diary 2 January 1861
4 <u>D.S.A. 11th Report</u> 18
5 <u>S.C.S.I.</u> A.109
6 <u>D.S.A. 29th Report</u> viii
7 Table IX
8 <u>R.C.S.I.</u> 2nd Report I xxvi, A.6193 (Sales) A.2153 (Shore) A.6277 (Miall) A. 5153 (Watts) A. 7432 (Roscoe) and <u>S.C.S.I.</u> A. 5741 (Roscoe)
9 <u>R.C.S.I.</u> A. 6476
10 <u>MS.M</u> 19.89
11 <u>D.S.A. 19th Report</u> 25-27 and <u>20th Report</u> 40
12 Table X
13 <u>N.A.P.S.S. 1874 Report</u> 58-60 (Napier)

said one critic.[1] The Department claimed that "the practice of continuous study" was increasing,[2] and statistics show a gradual decrease in the proportion of students entering examinations for the first time.[3] The "certificate grabbing" which enabled one student to enter a Training College with 22 certificates[4] was also discouraged by regulations which restricted payments on any one student to five, and later, three subjects in one year.[5]

iii) Transfer of responsibility from Local Committees

"Evening classes are the continuative secondary schools of the masses", C.A. Buckmaster agreed in 1895, and he correctly predicted that they would "continue for a long time".[6] The local authorities set up under the Technical Instruction Act of 1889, which gave powers to the Department to decide what was, in effect "Technical Instruction"[7], grew increasingly powerful, and their Schools gradually drove out of existence the less prosperous Schools, founded by Local Committees, which had as their only real source of income fees and Department grants. The action of the Department in throwing the cost of less advanced instruction in Science on the "local authorities", when it ceased to make payments on such work[8], reduced their income still further. It was suggested that both School and the Council Polytechnics could exist together, with the smaller Schools, which would be "nearer for the tired workman", acting as "feeders".[9] The Department expressed no regret at the disappearance of these Schools: they had, it said, "been absorbed by the more efficient in many cases" and "the more stringent requirement for local support" had been a factor in their decline.[10] By 1897, the year in which William Garnett became Secretary to the Technical Education Board of the L.C.C.,[11] the County Council spent £128,000 on its eleven Polytechnics: grants from the Department to aid these institutions came to only £9,000 of this figure, with the result that "undue prominence" was "not given to its examinations".[12] The year before, the Department had reported that "Local Committee control" was now largely nominal, and that there was a growing assumption of control by the Councils.[13]

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1 R.C.T.I. A.505 (Curzon)
2 D.S.A. 30th Report 56
3 Table XV
4 R.C.T.I. A.3481 (Sharpe)
5 Section (d)(ii)
6 R.C.S.E. A.10397
7 Chapter V section (d)(iv)
8 Chapter V section (c)(iii)
9 Nat. 8 October 1891
10 D.S.A. 38th Report viii
11 Nat. 13 May 1897
12 Ibid. 4 November 1897
13 D.S.A. 44th Report vi

Despite these changes, the evening schools provided the great majority of students for the examinations throughout the period. The "grouped course" idea would not, however, be really developed until the new century.[1]

k) Reactions to the system of payments on results in Science

i) The first years

There appears to have been a much more general acceptance of the system on the "Science" side than there had been when it was introduced in the field of Art. It was generally favoured by witnesses before the Samuelson Committee.[2] There were suggestions of capitation payments,[3] but teachers on the whole appear to have welcomed the system which often enabled them to earn quite handsome sums. Complaints were however made about changes in regulations without warning. These were "too frequent ... and not notified in advance",[4] and there were "evils in too many changes".[5] A number of witnesses before official enquiries made these points.[6] In defence of the system, Cole stressed its "experimental" nature. "We are still learning our business", he said, "but we never do anything before trying to find out beforehand how it will act".[7] The amount allowed for in the estimates was never fully taken up, said Donnelly,[8] The official instructions to examiners laid down the general proportions of "passes",[9] and examiners were expected to pass a large proportion of pupils "if well taught".[10] (On one occasion, Donnelly was "concerned because papers had been marked too hard".[11])

Although the Department had its critics, the general feeling at the end of Cole's term of office was favourable. "Much valuable work has been done": "much has been achieved", admitted the normally hostile Engineer.[12] No steelworks was without its trained chemist, thanks to the Department, said Percy, a usually unco-operative Professor.[13] "Missionary work" and "vigorous and fair examinations" were applauded by Nature.[14] While the Samuelson Committee was generally critical of the work, its Report did say that the

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1 L. Selby Bigge The Board of Education (London Putnam 1927) 140
2 S.C.S.I. A. 4902 (Ripley), A. 5844 (Platt), A.6090 (Rumney), A.7450 (Watson) A.7729 (McAdam)
3 Ibid. A.5156 (Watts), AA. 6170-6172 (Sales)
4 Nat. 18 August 1870 ("Science teacher")
5 MS letter Roscoe to Huxley 15 October 1871
6 S.C.S.I. A. 3904 (Coomber), R.C.S.I. A.6151 (Sales), A. 2152 (Shore) A. 2309 (Applegarth)
7 S.C.S.I. AA. 45 and 247
8 D.S.A. 22nd Report 4
9 R.C.S.I. Appendix IV (Science Form 341)
10 Ibid. Appendix IV (Donnelly memorandum)
11 Cole MS Diary 23 June 1870
12 Engr. 24 May and 2 August 1867
13 Engg. 14 June 1867
14 Nat. 4 August 1870

instruction, while elementary, was "sound".[1] The system was defended before the Committee by several witnesses[2], and one major critic's chief charge was that it did not help enough with finance.[3] Its successor, the Royal Commission, noted "the degree of success in the face of obstacles (which) had been due to the vigorous and able administration,.. and the efficient way in which the examinations have been conducted", and said that "a remarkable impulse" had been given "to elementary science teaching throughout the United Kingdom".[4] Two witnesses spoke very favourably indeed on the Department.[5] Others welcomed the Department's services. Cole must have been particularly pleased at a public defence by his favourite author, Samuel Smiles.[6] Examinations had "greatly stimulated the teaching of Science", said the Secretary of the Birmingham and Midland Institute in 1868.[7] At the meeting of the British Association in 1873, the Department's "useful work" was applauded.[8]

There were, of course, critics. The objections of Parliament and Press are detailed later. "Thirty years of waste" could be deplored in 1867,[9] and there were criticisms of "State interference".[10] Objections were made to the Samuelson Committee that the services of the Department were not sufficiently well publicised.[11] Buckmaster had of course been appointed for just such services, and he and Donnelly strongly refuted the charges.[12] When seen against the background of the times, the essential point was made by Iselin, who said that the State could not be expected to create a demand, and then set out to supply it.[13]

ii) <u>The influence of T.H. Huxley</u>

The greatest propagandist for the Department was Thomas Henry Huxley, the most eminent science teacher of the age. In an effort to persuade his friend, Hooker, later P.R.S., to become an Examiner, he wrote "I can assure you that (the examinations)are very genuine things, working excellently ... this is the most important engine yet invented for forcing Science into

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1 <u>S.C.S.I.</u> iv
2 <u>Ibid.</u> A.1479 (Percy) A.3737 (Moseley) A. 5832 (Platt) A.6967 (Clapham)
3 <u>Ibid.</u> A. 6143 (Chamberlain)
4 <u>R.C.S.I.</u> 2nd Report I xix and xxviii
5 <u>Ibid.</u> A. 8978 (Jarmain) A.9008 (P. le Neve Foster)
6 <u>Engg.</u> 15 November 1867
7 <u>N.A.P.S.S. 1868 Report</u> 447
8 <u>Br. Assn. 1873 Report</u> 221 (Williamson)
9 Letter in <u>Engr.</u> 9 August 1867
10 <u>N.A.P.S.S. Report 1859</u> 103 (E. Baines) <u>S.C.S.I.</u> A. 5039 (Sales) A.7678 (McAdam) and <u>Engr.</u> 17 January 1873
11 <u>S.C.S.I.</u> iv, A. 8978 (Jarmain) AA.51081, 5152 (Watts) A.7814 (Gill)
12 <u>Ibid.</u> AA. 8204-8208 (Buckmaster) AA. 8178-8184 (Donnelly)
13 <u>Ibid.</u> AA. 5141 and 5426

ordinary education".[1] He strongly refuted a suggestion by one of Roscoe's assistants that the Department was "a giant red-tape machine"[2], and pointed out its solid worth.[3] The Department was "one of the greatest steps ever made ... to spread Science from below upwards" in his belief.[4] "My friend Colonel Donnelly" was praised by him in 1877, as was the way in which "his Department spares no time and trouble ... which has led to incalculable good".[5]

His evidence to the Technical Instruction Committee was full of tributes. The "science training" was "of as thorough and complete a character as was not to be had in any University in the country thirty years ago ... when scientific men were all officers with no rank and file". There was a "scholarship ladder", the "Universities and Public Schools" would be "pushed aside if they did not heed",and the system was "working well" and had "surpassed my highest hopes".[6] It was because he believed so firmly in the value of the Department's work that Huxley used his influence to associate its examinations with the system of Technological examinations developed by the City and Guilds, as has been recorded.[7] Such praises, and such defence, must have been of the greatest value in impressing the world at large on the merits of the Department.

iii) <u>The middle years</u>

The middle years of the Department's existence saw little widespread criticism of its scheme of incentives. A Senior H.M.I., who might have been reminded that criticism, like charity, should begin at home, told the Technical Instruction Commission that the Department's system was "a misfortune", with pupils being used as "grant-earning machines" to "suit the teachers' pecuniary interests".[8] The "pecuniary inducement" encouraged "universality, not excellence", charged another critic,[9] and "it was a vicious extension of the system of doing everything by examinations", believed a third.[10] The better training of the teachers would have been one way to improve the methods of instruction,[11] but as late as 1881 the Department believed that there was "no great outlet for the highly qualified science teacher, able to

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1 <u>MS</u> letter Huxley to Hooker 6 October 1864
2 Enclosed in a <u>MS</u> letter Roscoe to Huxley 24 July 1871
3 <u>MS</u> letter Huxley to Roscoe 24 July 1871
4 <u>R.C.S.I.</u> A.8000
5 Speech to the Working Men's Club and Institute Union 1 December 1877 (<u>F.R.</u> xxiii January-July 1878 48-58)
6 <u>R.C.T.I.</u> AA. 2987, 2988, 2991, 2993, and 3055
7 Chapter IV Section (f)
8 <u>R.C.T.I.</u> A.3717 (Fitch)
9 <u>N.A.P.S.S. 1874 Report</u> 58-60 (Napier)
10 <u>N.A.P.S.S. 1879 Report</u> 21 (Lyulph Stanley)
11 <u>N.A.P.S.S. 1874 Report</u> 356-360 (Samuelson)

make a living by that alone".[1] The system which Donnelly had called "an appeal to private enterprise" continued, therefore, for many years, and in the process some teaching which was inspired and directed by cupidity was to be expected.

The Department still had to refute charges that standards were too high. Some teachers "had the audacity" to write to Huxley to complain, and to say that "they would stop teaching if the results were not more favourable".[2] In 1880, London teachers planned a protest meeting because the examinations of that year had been particularly difficult.[3] Standards could be expected to rise with the years, Donnelly pointed out, but he added that the pass mark level was adjusted as necessary, and that, in fact, the total allowed for payments in the estimates had not, so far, been fully taken up.[4]

The Technical Instruction Commission, while it could suggest improvements, found the system "more or less flourishing", said that it could trace the influence on local products, referred to "intelligent and able administration", and believed that it was "not desirable to disturb the system in its main lines", mentioning especially "the careful testing".[5] Individual witnesses were in general agreement on the efficiency of the system[6], although it is noted elsewhere[7] that there was major criticism of the "practical" applications of its subjects.

The Labour Representation League was presumably so satisfied with the Department's efforts that it proposed that all Technical Education services should be placed under its control.[8] The Marquess of Salisbury, son of Cole's old chief, applauded its work.[9] Even Samuelson could say that "the elements of physical science" were "taught with considerable success".[10] Speakers at Social Science Congresses gave their praises in 1877 and 1879.[11] There was, however, serious criticism of the "old fashioned content" of papers in Naval Architecture at a stormy meeting of the Institution of Naval Architects in 1882: the Examiner, Baskcomb, defended his papers by saying that he "acted under restraint and instructions".[12]

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1 D.S.A. 29th Report 72
2 R.C.T.I. A. 3015
3 Engr. 18 June 1880
4 D.S.A. 22nd Report 4
5 R.C.T.I. 2nd Report I 513, 515, 518
6 R.C.T.I. A.1922 (Chapman) A.2115 (Solly) A.2291 (Millis) A.2401 (Berry)
7 Section (h)
8 Engr. 27 November 1874
9 Nat. 28 January 1875
10 F.R. xxxv June - October 1881 91-97 (Technical Education in Saxony)
11 N.A.P.S.S. 1877 Report 111 (G.N.Cunningham)
N.A.P.S.S. 1879 Report 43 (C.J.Dawson)
12 Engr. 15 April 1881.

Against criticisms made in the Department's last years must be seen such tributes as those paid by a Social Science Congress speaker who talked of "hearty and well directed labours ... devotion and thoroughness"[1], and Playfair's belief that the Department was "doing excellent work in diffusing a taste for elementary science among the working classes".[2] Much was being done by the Department to raise standards, Roscoe believed.[3] The "great and beneficial results" of the work were praised in its first issue by the magazine Science and Art,[4] and it was seen as "a strong foundation for Technical Education" by Engineering.[5] R.H. Gregory, a former scholar at the Normal School, defended the Department against "cheap criticism" in 1893.[6]

iv) The major criticisms

The feeling still prevailed in certain quarters, however, that "theoretical" instruction had little point. As usual, the Engineer led the van on this theme, printing letters, quoting speakers, and reiterating its own views.[7] Even the normally favourable Engineering agreed that "most operatives do not need theory" and it doubted if improved production would result from "scientific education ... of the average workman",[8] although it could see the value for "the diligent apprentice".[9]

The critics of the system based their charges on four main counts, that "cram" was too easily encouraged and rewarded, that the examinations were becoming increasingly more difficult, that syllabuses were rigid and out of date and that superficiality was being encouraged. "Cram is easy", said a scientist at the Social Science Congress in 1883.[10] A former Vice President talked of "passing by the thousands, using cram books forbidden in all Schools of Technology".[11] "I simply crammed ... in the few weeks before the examination ... in a few weeks I had forgotten all", a student said in his reply to a questionnaire from the Committee on the Teaching of Chemistry of the British Association.[12] The Mechanical Drawing system "encourages mere copying",

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1 N.A.P.S.S. 1883 Report 244 (F.S.Powell)
2 Presidential Address to the British Association (Br.Assn. 1885 Report 3)
3 The Times 18 March 1887
4 S. and A. April 1887
5 Engg. 13 November 1891
6 W.H.G.Armytage Sir Richard Gregory: his life and work (London Macmillan 1957) 27
7 Engr. 15 May, 19 June, 1885, 16 November 1888, 21 October 1894, 12 June, 31 July, 9 October 1896, 18 June 1897
8 Engg. 17 November 1893 and 2 November 1894
9 Ibid. 17 July 1896
10 N.A.P.S.S. 1883 Report 249)(Dr. Gladstone)
11 Lord Norton (C.B. Adderley) Middle Class Education N.C. February 1883
12 Br. Assn. 1888 Report

Silvanus Thompson told the London School Board in a report on Technical Education.[1] "Cram by teachers who know naught of industry, and results decided by unpractical men" were condemned by the Art Journal.[2] "Teaching a smattering" and "encouraging a vicious system of copying in Engineering Drawing" were charges made by a Professor.[3] This aspect of the system was "demoralising"[4], encouraged"merely teaching for grant"[5] and could result in the achievement of high honours "through study of the text-book only".[6] (The provision of text-books is later considered.[7])

The examinations, particularly in Practical Geometry,were becoming increasingly difficult for artisans, it was claimed.[8] "Unfairness" in many May examinations was charged by a group of London teachers, who said that an Advanced First Class pass was the equivalent of a D.Sc.[9] "A slaughter of examinees" was reported in 1889.[10] Misprints and a wrong distribution of questions[11],"frequent mistakes in setting and marking"[12], "errors of fact",[13] and errors in pass lists[14] were quoted by other critics.

The examiners, too, were criticised. It was alleged that definite answers were required on matters where even leading scientists of the day did not agree.[15] There was too much insistence on "the" method and "the" principle, it was said.[16] The "examiners' fluky ways" were disliked.[17] The "pure" or "applied" question entered here, too. "Papers are still deficient in practical applications", believed R.H. Gregory.[18] There was a "need for practical men" and "real engineers"[19] as examiners. It was "high time" that they were "instructed in workshop technology" to avoid errors in their papers.[20] The syllabuses they prepared were year after year "the same old thing".[21]

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1 Nat. 1 January 1885
2 Art J. 1889 82
3 Engr. 19 February and 11 March 1892 (R.H.Smith)
4 Engg. 24 March 1893
5 Engr. 19 May 1893 (Report of the Technical Education Committee of the L.C.C.)
6 Engg. 18 August 1893
7 Chapter XII Section (g)
8 S. and A. April 1889 ("Art Master")
9 Ibid. July 1889
10 Ibid. November 1889
11 Nat. 30 May 1889
12 S. and A. September 1892
13 Engg. 22 November 1893
14 S. and A. August 1892
15 Ibid. July 1889
16 Engr. 16 September 1892
17 Ibid. 23 September 1892
18 Nat. 21 December 1893
19 Engr. 7 December 1892 ("Progress" and "Head Draughtsman")
20 Ibid. 22 November 1893 ("Spanners")
21 Engr. 21 September 1894

The papers set in Applied Mechanics and in "Steam" by Goodeve, whose courses at the Normal School were also much criticised, were objected to on several of these counts. These subjects, as examined, were "particularly susceptible to cram", believed the Engineer. They were "Narrow and out of date" and were set exclusively on the Professor's own text-books, it was charged. "Unfair", "containing catch questions", and "leaning towards questions on clocks and watches", were other terms used by correspondents.[1] The Engineer was not alone in leading this campaign: a member alleged in the House that the "papers in Steam really examine Ancient History".[2]

v) The last years of the system

More contact between examiners and teachers than "the mere publication of brief yearly Reports" was suggested as one way of overcoming difficulties.[3] So far as can be discovered, this was not developed, but the increase in the staff of Inspectors, which will be detailed,[4] must have improved "communication". The handing over of responsibility for more "elementary" instruction to the Councils was seen by the Department as one means of "checking the vicious practice of ... numerous subjects (being) taught in a perfunctory manner".[5] All these criticisms, however, were to culminate in the assault on the Department's system which was made before the Commission on Secondary Education.[6] After that Commission sat, the Department could still be attacked by implication. In explaining his heuristic method, Armstrong dismissed "much Technical Education as mere instruction",[7] and one of his supporters said that "Science is at war with the examination system ... only by seeing and handling can the mind be led in the right way".[8] In the very last years of its existence the Department gave up its cherished system.[9] It is, however, worth recording that a former most outspoken critic, G. Halliday, had been so won-over by 1893 that he said that he believed that its system was now working so well that its field of operations should be extended to include "all technical examinations".[10]

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1. Engr. 27 July, 10 August, 24 August 1888, 16 September 1892, 2 June 1893 and 26 April 1895
2. Hd. XV (1893) 752 (Leng)
3 S. and A. May 1888
4 Chapter X Section (d)
5 D.S.A. 39th Report xxi
6 Section (i)(v)
7 Nat. 4 November 1897
8 N.C. January 1898 (Michael Foster)
9 Chapter V Section (c)(vi)
10 Engr. 18 May 1894

The last word must go to H.G.Wells. He believed that it was the misuse of the system, and not the system itself, which was to be condemned, and he made a most important point when he said that "there is a David and Goliath charm about attacking the Department ... it is a convenient mark and easy to throw at".[1] The Department had taken the initiative in encouraging schemes of science teaching: that its system was open to abuses, and that it was retained for too long, cannot be denied, but much of solid worth had been produced.

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1 Nat. 27 September 1894

CHAPTER SEVEN

THE SOUTH KENSINGTON SCIENCE COMPLEX

a) The Royal College of Science

i) Placing under the Department

ii) A conflict of objectives

iii) Growing disharmony

iv) Hopes and disappointments

v) A period of calm

vi) A revival of troubles

vii) Attempts to increase success as a Mining College

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ix) Renewed schemes for teacher training

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xi) The Normal School of Science

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b) The Royal School of Naval Architecture

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i) Provincial Museums

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iv) Delays in schemes for development

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vi) General value

a) The Royal College of Science

i) Placing under the Department

Of the science institutions fostered by the Department, the most notable was its own Central Science institution,[1] whose basic functions, name and location, changed several times during the period. The Museum of Practical Geology and its School of Mines were placed, with the Geological Survey, under the Department in 1853. This acquisition was not discussed by the Cabinet, according to Cole.[2] To the School was joined the Royal College of Chemistry, partly to keep in Britain the restless German chemist, Hofmann, who was its Head,[3] and partly so that its premises in Oxford Street might be used. As part of the arrangements, the College's debt of £350 was paid off.[4] Hofmann replaced Playfair as Professor of Chemistry in the new institution,[5] and told his predecessor of his gratitude for the part he had played in the negotiations.[6] Gathering these two institutions under the Departmental wing, and making them part of its wider schemes, proved to be no easy matter. It was to cause "many a struggle and a feud",[7] and much of this feuding centred round the relations between the Department and its nominal subsidiary, which had a history of independence, however brief, which was not shared by the School of Design. The "School and Museum" would "remain undisturbed in their internal arrangements", reported the Art Journal.[8] There was "not a very minute connection ... apart from Parliamentary responsibility" and "not much muddling with the School by the Department", claimed Cole.[9] The staff of the School, however, believed that there was "much muddling", and that its arrangements had not remained "undisturbed". This was deeply resented.

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1 The development of the Royal School of Naval Architecture is briefly detailed below. A "College of Science for Ireland" was recommended in 1866 (D.S.A. 13th Report 19 on the Royal Commission on a Department of Science and Art for Ireland). The usual provision that "the practical application of science to industry should not be undertaken" was applied when it opened in Dublin in 1868. (D.S.A. 15th Report xx) The deficiencies of instruction in Irish Schools limited its progress, (D.S.A.32nd Report 269) and it was initially "little availed of" (D.S.A.33rd Report 5). It received scholarship holders from England, and there were complaints, which were denied, that its staff was exclusively English [Hd. CCCXLVII (1890) 213, 897-898]. The provision of accommodation would appear to have been particularly bad. [Hd. CCCXLVII (1890) 1918-1919]. It produced many well trained scientists, but they had perforce to go to England for employment. It cannot be said to have been very successful in its objectives, to aid the development of Irish industry.

2 S.C.S.I. A.915

3 R.C.S.I. A.333 (Cole)

4 D.S.A. Calendar 1893 27 and Treasury out letters 7.9 10 78 (Treasury to Board of Trade 27 June 1853)

5 MS.M 1.222c

6 MS letter Hofmann to Playfair 19 February 1853

7 Wemyss Reid op.cit. 143

8 Art J. March 1853

9 R.C.S.I. AA. 2 and 19

ii) A conflict of objectives

The debate was basically between the "pure" and the "applied" scientists. "Becoming a School of Science was a relinquishment of the original object of the School", thought its Registrar.[1] A Treasury Minute on the "take-over", that there should be "a school of the highest class ... including the means of furnishing competent and well qualified teachers for local institutions ... to encourage local institutions for practical science",[2] reflected the thinking of the leaders of the Department. It would be "not specially devoted to Mining but to all Sciences applicable to industry, with a special organisation as a Training College for teachers".[3] This last function would not really become operative for another twenty years. The General Regulations for the School concentrated on accommodation and remuneration, with no reference to teacher training.[4] There was an attempt to form classes for teachers,[5] but in the event, only a handful qualified, as has been recorded.[6]

The great opponent of any change of function was the Director, de la Beche, who had created the Museum and the School in the first place. On the opening of the School, its purpose had been announced as "to give ... a practical direction to the course of study so as to enable the student to enter with advantage upon the actual practice of mining, or of Arts, which he may be called upon to conduct".[7] While de la Beche had been Playfair's patron, being instrumental in obtaining him government employment at a point when he was preparing to emigrate to Canada,[8] and securing for him the appointment of Professor of Chemistry in the School, he was not prepared to relinquish that objective. The Director had devoted only two lines of his lecture on the results of the Great Exhibition to the fact that "industrial education has to be extended",[9] and, as has been detailed, he had some reservations on the arrangements for the integration of the School at the time of the Department's foundation, although he had been, in general, co-operative.[10]

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1 S.C.S.I. A. 1247 (Reeks)
2 Quoted in P.P. (1881) LXXIII (563) 5
3 D.S.A. 1st Report 177
4 MS.M 2. 3-6
5 D.S.A. 1st Report xlix, and MS letter de la Beche to Playfair (MS.M 2.223-224)
6 Chapters II Section (b)(ii) and XI Section (B) (a)(i)
7 Centenary of the Royal School of Mines 1851-1951: Some notes on the History of the School. (London Tay Press 1951: private circulation) 10
8 Ibid. 5
9 Lectures on the Results of the Great Exhibition I 71
10 Chapter I Section (h)

"De la Beche was obstructive",the Treasury was told soon after amalgamation.[1] Playfair thought that the Director had given unwilling consent to his appointment as Secretary, but he believed that he had the support of the other Professors "as a means of correcting the defects of that Institution".[2] The Science Secretary was, in theory, Vice Principal of the School, but he "never acted on this Minute" as it would have made him "the official inferior of the Director".[3] (He did, however, counter-sign requisitions for the School).[4] The Director's "jealousy was directed towards Playfair",Cole was told by Cardwell,[5] but he most probably saw Cole, whom he would probably resent as a bureaucrat without any scientific background,[6] as his chief opponent.

iii) Growing disharmony

Within months of the take-over, Playfair was thinking of applying for the Edinburgh Chair in Chemistry (which was to be his in 1858) "unless there were changes in Jermyn Street".[7] "The inevitable failure" of the Science scheme would come, he predicted, since the chief element of success, the Central School, had been lost, and he asked the Consort to excuse him from blame.[8] De la Beche was dealing with Cardwell over his head, he charged. (Cardwell excused his participation by saying that the alternative would have been "a positive rupture".)[9] Cole urged a "positive revolution" on Cardwell[10], and later recorded the Professors' belief that there was a conspiracy against them.[11] "Much evil" was "likely to ensue from the difficulty of getting Sir Henry to work with you", Forbes, Huxley's predecessor at the School, told Playfair. He said that when Cardwell had asked him for his advice, he had counselled a concentration on general administration,"leaving the organisation of the School to Sir Henry".[12] There was an "angry remonstrance" from the Director over a "circular to the Trades",which led to a Minute which said that all printed papers must first be approved by the Board.[13] As a consequence, Playfair

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1 Cole MS Diary 4 April 1853
2 MS letter Playfair to Phipps 18 July 1853
3 S.C.S.I. A. 1064
4 MS.M 3.10 et seq.
5 Cole MS Diary 2 July 1853
6 Reeks op. cit. 63
7 Cole MS Diary 14 July 1853
8 MS letter Playfair to Phipps 14 July 1853
9 MS notes by Cole of a discussion with Playfair 23 July 1853
10 Cole MS Diary 16 August 1853
11 Ibid. 6 January 1854
12 MS letter Forbes to Playfair 21 May 1854
13 Cole MS Diary 1 July 1854

resigned his titular post as Vice Principal, which led the Consort to fear that the School "would not thrive".[1]

iv) Hopes and disappointments

Another "timely" death offered hope for better relations and ultimate success. Playfair reported the death of de la Beche to Cole in April 1855 with the hope that "nothing will be done in a hurry about his successor".[2] De la Beche could not "be said to have extended the usefulness of his Department" the Consort believed. His successor, he thought, "must see himself as the Head of a government educational establishment for the diffusion of Science in general as applied to productive industry".[3] The appointment[4] of Sir Roderick Murchison[5] came as a bitter disappointment to Playfair. "All my proposed reforms and division of the Survey from the School over-ruled", he told Cole.[6] "Great changes are needed", Redgrave had told Stanley.[7] Cole's own scheme for a basic training in Science matched Playfair's.[8] All the efforts of these officials were to come to naught. Murchison was to be just as obstinate about "interference" as his predecessor had been. Lord Stanley "refused to be left alone while Murchison took up his duties".[9] There was soon a "grand row", when the new Director threatened to resign if Cole, as Inspector-General, were to be given any duties extending over the School.[10] Lord Stanley inserted a paragraph in Cole's memorandum which said that "the Director continues directly responsible to the Board".[11]

Although the School may have been seen as "a convincing proof of the feeling of the advancement of Science by the government",[12] and its staff were prepared to give "evening lectures to working men on the general applications of Science[13]", they remained firmly convinced that it was primarily a School of Applied Science rather than an institution where pure Science was to be studied.

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1 MS letter Phipps to Playfair 6 August 1854
2 Cole MS Diary 12 April 1855
3 Reeks op. cit. 87 (Memorandum of 2 May 1855)
4 P.M. 52.3055 (2 May 1855)
5 Biographical Appendix
6 MS letter Playfair to Cole 25 May 1855
7 MS letter Redgrave to Cole 31 May 1855
8 MS letter Redgrave to Cole 23 June 1855
9 MS letter Playfair to Cole 4 June 1855
10 Cole MS Diary 7 June 1855
11 MS letter Redgrave to Cole 12 June 1855, D.S.A. 2nd Report v-vi and MS.M 3.123-124
12 Br. Assn. 1856 Report (Professor Daubeney)
13 D.S.A. 2nd Report xxxii et.seq.

At the period when the Department was being placed under the Lord President, Murchison expressed his fears of control by "persons eminent in scholarship and abstract science, yet ignorant of the fact that the continued prosperity of the country depended on the diffusion of scientific knowledge of the masses".[1] He was assured that the School would "remain on the same footing",and that he would [illegible] "receive the same support as before",and it was implied that he had, in fact,"acknowledged the value" of such support by talking of the School's success.[2] While Cardwell expected the School "to remain under the Board because it was so allied with trade"[3], it was in fact transferred with the rest of the Department to the Lord President".

v) A period of calm

Murchison was able to convince the political chiefs that schemes for wider teaching of science were not yet a worthwhile proposition. "Murchison's wish for independence" was noted, without comment, by Cole.[4] Playfair had by this time given up his hopes for wider developments, and Cole and the newly-recruited Donnelly agreed that schemes for training teachers were premature,in view of the general lack of response to the limited schemes which had been tried up to that time. In 1859, the name of "Government School of Mines" was officially re-adopted,[5] and was an official acceptance of the limited scope as an "applied science" institution. The "name was changed to remove grounds of jealousy", Huxley believed.[6] Murchison's application for the change of name included the promise "to teach all branches of Science which have a direct bearing upon the development of the mineral and agricultural resources of the country".[7] It had been a "mistake to set up a government Institution for Science at all",Playfair told Cole much later.[8] There was "no Central School of Science, and never has been", Cole said in 1868.[9] There had certainly been little success in developing the Central School's contribution to wider schemes in these first years.

The staff of the School were willing to be connected with the Science examinations scheme,[10] and Huxley and Hofmann attended the first examiners'

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1 Letter from Murchison to Stanley 25 January 1856 [P.P. (1856) LV (475)]
2 Letter from Playfair to Murchison 10 May 1856 (Ibid. Published by Order of the House of Commons 2 June 1856)
3 Cole MS Diary 18 July 1856
4 Ibid. 6 July 1858
5 D.S.A. 5th Report 8
6 S.C.S.I. A. 7972
7 D.S.A. Calendar 1893 27-28
8 Cole MS Diary 22 June 1869
9 S.C.S.I. A. 19
10 Cole MS Diary 18 and 22 July 1859

meeting.[1] (This connection was to be maintained until eventually the appointment to a Chair there was seen as carrying with it the position of Chief Examiner in the subject).[2] Otherwise, relations remained distant but correct.

vi) A revival of troubles

Early in 1860 two developments threatened to cause trouble. Comments made by Murchison on the duties of Reeks, and on the establishment for Surveyors in his Annual Report, "placed him in a position of apparent opposition to My Lords". Such views would, therefore, be omitted from the printed version, he was told in a Minute drafted by Cole.[3] The second cause of friction was Cole's attempt to enforce the keeping of Diaries in all institutions connected with the Department, to which reference has been made.[4] Murchison's reply to the official instruction signed by Macleod was addressed to "My Lords", regretted the "change in the channel of communication",and hoped that this was "not a precedent".[5] The Board noted and granted his request to attend its meetings when "Jermyn Street" was being discussed.[6] The opposition of the Professors was remarked upon by Cole.[7] The outcome was that Diaries were insisted upon for the Surveyors but not for the staff of the School.[8] Murchison was "remonstrating against monthly progress reports" the following year,[9] but nothing more is heard of the matter. Any attempt at direction by Cole, or any suggestion that he was not to enjoy direct access to "My Lords" was always bitterly resented by Murchison[10], but he had gained the right to sit at Boards, and continued to exercise it.[11]

viii Attempts to increase success as a Mining College

It would be difficult to argue that the School had been successful even as an institution which was helping to produce trained scientists for the mines. There were never more than 18 "matriculated students" at any one time in the years up to 1859[12], and there was an annual average of only 54 "occasional students".[13] Students entered at 16 with some experience of Drawing, Algebra

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1 Cole MS Diary 8 November 1859
2 Engg. 4 January 1895
3 MS.M 11.39
4 Chapter III Section (b)(i)
5 Letter of 30 March 1860 [P.P. (1860) LIII' (557)]
6 MS.M 11.100
7 Cole MS Diary 26 April 1860 (Percy) and 3 May 1860 (Jukes and Huxley)
8 Ibid. 8 May 1860 and P.P. (1860) LIII' (557) Letter of 9 May 1860
9 Cole MS Diary 2 May 1861
10 Reeks op. cit. 97
11 MS.M 12.89a et. seq.
12 Reeks op. cit. 64
13 D.S.A. Calendar 1893 28

and Geometry[1], but in the state of science teaching at the time, they can have possessed little basic scientific knowledge. "My Lords" attempted to improve the course, directing Cole to "prepare a Report on preserving and improving the Jermyn Street institution".[2] A change of name to "Royal Mining College", and a two year course leading to a diploma, were suggested by Huxley.[3]

The scheme discussed by the Board and with the Treasury[4] appears to have envisaged degrees in Mining.[5] When Cole paid one of his rare visits to the School, the Director and staff wished such degrees to be granted by London University.[6] (Murchison told Cole that a letter from the Department on the subject was "the most pleasant he had ever received".[7]) The development at the School of instruction in Mining subjects was recommended by a special Committee of Granville, Lowe and Trevelyan of the Treasury, with "elementary instruction .. for students who do not come prepared". They felt that facilities for study in science "beyond .. mining" should not be offered, because, they said, the success of the 1859 Scheme had shown that "the public with a slight stimulus will provide it for themselves".[8] The name of the School was changed yet again to that of "The Royal School of Mines ... to distinguish it as the National School of Mines".[9] Thus, it appeared that the defenders of the institution as a Mining School ,and nothing beyond this,had finally won the day.

viii) Schemes for wider functions

Donnelly was not content that this state of things should prevail. In this he found an ally (who was to become a great personal friend) in T.H.Huxley. (Huxley had joined the School as Botany Lecturer in 1854, as Forbes' successor,[10] and in 1859 had taken over the Chair of Biology from Stokes[11]). While there was still no great demand for trained science teachers, the early success of the 1859 scheme must have suggested that this demand would eventually develop. Gladstone would be favourably disposed towards a move of the School to South Kensington, if a case could be made out, Lowe told Cole in 1862.[12] The "organisation of a Science training college ... the whole at South Kensington",

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1 D.S.A. 1st Report 177
2 Cole MS Diary 6 June 1861
3 MS letter Huxley to Granville 16 June 1861
4 Cole MS Diary 21 June, 22 June, 2 August 1861 and 14 March 1862
5 Ibid. 22 June 1861
6 Ibid. 11 July 1861 and MS.M 13.159-160
7 Ibid. 31 July 1861
8 D.S.A. 10th Report 190-193 and D.S.A. Calendar 1893 28-29
9 D.S.A. 10th Report xiii
10 MS.M 2.227
11 MS letter Tyndall to Huxley 5 November 1859
12 MS letter Lowe to Cole 13 May 1862.

was discussed by Cole, Donnelly and Huxley in 1864.[1] Cole went so far as to "draft out a ground plan for Science Schools" in 1866[2], and believed that he had Lowe's support in this.[3] (Lowe later questioned the origins of the scheme[4].) A proposal was made by Donnelly that the School should form the nucleus of a College of Science, in a memorandum which he prepared for the Board in 1867. (Cole removed a reference to teacher training.)[5]

Hofmann left the College of Chemistry in 1864 to return to Germany because, in the belief of a student at that time, he saw little chance of its development.[6] (He continued to correspond with Cole for several years.) "The admirable science schools of the Department" were linked in name with the School of Mines in a tribute in 1867,[7] but the unbalanced nature of the courses there was raised in the Engineer in the same year. The lack of basic science training of entrants, the "superficiality" of lectures, and the lack of any teaching of Mathematics,were all attacked by that journal.[8] A student at that time later said that "courses were sampled at will ... by free-lances".[9] Other deficiencies were charged by witnesses before the Samuelson Committee. "The absence of Mathematics" was "a fundamental defect", said Huxley.[10] Botany, Agriculture, Civil and Mechanical Engineering were other necessary but missing subjects, agreed a Professor and the Registrar.[11] The poor laboratory accommodation was commented upon.[12] The School was "not so successful as it might be because of the connection with the Geological Survey ... and the lack of an expert Headmaster", said Cole. He pointed out that a haphazard lodgings system did not predispose parents to send their sons to face the hazards of life in the Metropolis.[13]

"Fusion" with the newly developing Royal School of Naval Architecture at South Kensington was recommended by Huxley[14] The School was "not much used because of ... the (general) want of elementary science teaching", said Donnelly, and he argued that staff existed for the provision of a general course in a

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1 MS notes by Huxley, 30 November 1864
2 Cole MS Diary 2 July 1866
3 Ibid. 30 June 1866
4 MS letter Lowe to Cole 14 March 1869
5 Cole MS Diary 14 November 1867
6 H.E.Armstrong The Pre-Kensington History of the Royal College of Science and the University Problem (South Kensington Lamley 1921) 8
7 N.A.P.S.S. Report 1867 387-392 (Canon J.P.Norris)
8 Engr. 23 October 1868
9 H.E. Armstrong op. cit. 4
10 S.C.S.I. A.7957
11 Ibid. A. 1258 (Reeks) A.1446 (Percy)
12 Ibid. A. 7958 (Huxley) A.3890 (Coomber)
13 Ibid. A. 889
14 Ibid. A. 7971

College of Science which would absorb Jermyn Street.[1] A "Metropolitan College of Science" which would attract more students than the five or six who proceeded to the full Associateship each year at that time, and would be linked with provincial colleges, was proposed by him in the Memorandum he had prepared the previous year.[2] Huxley was in general agreement with these proposals.[3] The Select Committee recommended "a more intimate connection between the government institutions for teaching science in London", and said that "their constitution and management" required "further investigation.[4]

ix) Renewed schemes for teacher training

The effects of the movement for increased Technical Instruction could not have been successfully predicted as early as 1869, but the outlines of a "National Training School" with a Dean and Registrar, located at Kensington, were sketched out by Donnelly and Huxley in January of that year.[5] The Department's case for transfer to South Kensington was strengthened, unwittingly, by protests on laboratory accommodation problems by Murchison[6], and by Hofmann's successor, Frankland.[7] The success of the "summer courses" for teachers at South Kensington must also have been an important factor. Further support for the move was to come from evidence given before the Royal Commission on Scientific Instruction, but this was also to be the occasion for a last-ditch defence by Murchison and his supporters, who formed a majority of the staff of the School.

Before the Commission, Cole argued directly for a training school for teachers, saying that the Art School was in an analogous position and that it "would be more economically placed at South Kensington." He showed that he had made careful calculations on costs.[8] Huxley agreed that the School as it existed would be "the nucleus of an efficient body" for a Normal School of Science.[9] It was suggested that the London Training Colleges would avail themselves of science teaching facilities if the School were moved.[10] Frankland welcomed the idea of a move as giving opportunities to expand accommodation.[11]

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1 S.C.S.I. AA. 456 and 648
2 Ibid. Appendix II
3 Ibid. A. 7984
4 Ibid. ix
5 Cole MS Diary 31 January 1869
6 Letter of 5 February 1869 (D.S.A. 16th Report 24)
7 D.S.A. 18th Report xii
8 R.C.S.I. AA. 43, 44, 49 and 5994
9 Ibid. A.297
10 Ibid. A.8054 (Rigg)
11 Ibid. A.5703

"The School was efficient if not commingled with other public teaching institutions which have nothing in common with it",argued Murchison.[1] Smyth, the Professor of Mining, said that the School would "not remain a School of Mines if removed to Kensington".[2] Despite these objections, the Commissioners recommended the move, the addition of Mathematics to the curriculum, and common instruction with the Royal School of Naval Architecture in Mathematics, Physics and Mechanical Drawing.[3] Murchison then supported a Memorandum, signed by the "Mining Professors" to "My Lords",with the words "It would grieve me to see this compact body ... losing its special character by being moved ... and absorbed in a general College of Science".[4] The Director told Playfair that to carry through the Commission's recommendations would "involve the destruction of the School of Mines",but said that he believed that "Mr. Cole and the authorities ... do not wish to remove the School".[5]

The suggestions of transfer of site and change of function were not well received by the press. The Athenaeum talked of an "ill-defined School of Science".[6] The Engineer, while admitting that Murchison had been "feeble and over concerned with the Geological Survey", sneered that it was "curious that Professor Huxley sits in judgement on his fellow Professors".[7] It ended by saying that "Mr. Cole directed the conclusion on the move".[8] It returned to the attack, and suggested that "bye-play pluralism" was at work.[9] It quoted the Globe as saying that "South Kensington had set its evil eye on the School", and added its own gibe at "that scientific and artistic monster"[10] The Art Journal did not miss the opportunity for an assault, even though it was a rather belated one.[11]

x) Eventual success

"I wish to heaven ... you would join in setting up a proper Biology School", Huxley told J.D.Hooker at this time.[12] Things were "going to the dogs at Jermyn Street",said Hooker in reply. The School was "a house divided

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1 R.C.S.I. A. 2473
2 Ibid. A. 7440
3 Ibid First Report 1
4 Memorandum of 23 May 1871 [P.P. (1871) LVI 333]
5 MS letter Murchison to Playfair 10 May 1871
6 Ath. 25 March 1871
7 Huxley did in fact ask to be excused "as a Professor" from the Commission's discussions on this matter. (MS letter Huxley to Samuelson 3 June 1871)
8 Engr. 28 April 1871
9 Ibid. 19 May 1871
10 Ibid. 1 September 1871
11 Art J. September 1872
12 MS letter Huxley to Hooker n.d. (January 1871 ?)

against itself ... the paralytic chief of all reporting to the government through Cole, who revises his estimates".[1] Huxley's scheme was "quite the best and most organised", Hooker told Playfair at this time.[2] Murchison suffered a stroke in 1870, which rendered him almost totally paralysed until his death eleven months later.[3] A Committee of the Professors, with Smyth as Chairman, took over the general direction of the School, and Ramsay became Director of the Geological Survey and the Museum, with no responsibility for the School.[4] The Committee resolved that instruction in "Physics, Chemistry and Natural History should be located at South Kensington".[5] The accommodation was available there: new buildings had been erected for the Royal School of Naval Architecture, which had been housed since its inception in the old Art School buildings.[6] That School left the Department's care in 1873, but even before that, its officials pressed on with plans for the reception of the "Jermyn Street" institution. This was despite a Treasury objection that there was no authority for buildings for a Science School. This was made as early as 1870.[7]

The "new" Science Schools were inspected by Cole[8] and by Huxley[9] in 1872, and the first moves took place later in that year. Laboratory accommodation was not fully ready, and Huxley, Guthrie and Frankland pointed out that, as Examiners, they "strongly and frequently condemned classes for the lack of practical teaching" and would be embarrassed if teachers "arrived on courses to discover such facilities are not present here".[10] Huxley was expected to "produce more students" than he had done in a "room twelve feet square ... since he is already adept at producing bricks without straw".[11]

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1 MS letter Hooker to Huxley n.d. (July 1871 ?) (Both these letters are catalogued as 1872, but internal evidence would suggest that the year should in fact be 1871. In Hooker's letter he refers to Grey, who in 1872 would have been Marquess of Ripon for eighteen months, to the "recent" transfer of the Ordnance Survey to the Office of Works, which took place in 1870, and to the "paralytic chief", who was still alive in 1871 and dead in 1872).

2 MS letter Hooker to Playfair 4 October 1873

3 A. Geikie Life of Sir Robert Murchison (London Murray 1875 II 342-344

4 D.S.A. 19th Report xi

5 D.S.A. 20th Report xi

6 D.S.A. 17th Report xiii, R.C.S.I. xxii and P.M. 35. 19539

7 MS letter Donnelly to Huxley 22 November 1870

8 Cole MS Diary 4 February 1872

9 Ibid 14 April 1872

10 Letter of 16 December 1870 (P.R.O. Ed. 23.28)

11 Ath. 5 October 1872

Francis Rede Fowke and Redgrave were "timid about laboratories in the new Science Schools" so near to the Museum,[1] but Cole told Huxley and Frankland "not to badger them as they are quite friendly".[2]

The lack of Treasury authorisation meant that expansion until 1882 was allowed only a year to year basis. "What has been done for a Science School has not been trenched on", said Donnelly[3], and Lingen, now at the Treasury, refused to consider the "matter of improved accommodation. "while the constitution and duties of the Department are under review".[4] The Treasury had "pitched into the Science Schools", Donnelly said.[5] (This was at the period of Cole's retirement). Further moves continued to take place, however. The Geology course was transferred in 1877 after further representations from the Professors.[6] Mechanical Drawing transferred in 1880,[7] and Metallurgy in 1881. This led to the resignation of the Professor of Metallurgy, Percy, who wished to stay at Jermyn Street and offered to pay for improved accommodation,[8] but the Department claimed that the new laboratories were soon filled with students.[9]

xi) The Normal School of Science

The name "Normal School of Science" began to be used by the Department about 1877.[10] In 1881, it claimed that "the School has now to a great extent reverted to the original object of its creation, a General Science Training School".[11] "Practical science teaching" had "virtually ceased, except for mining students", when the Royal Commissioners on Technical Instruction visited Jermyn Street in 1882.[12] The Department awaited unanimous agreement on the part of the Professors before full transfer could take place:[13] Percy's departure made possible the adoption of a constitution which gave due prominence to science teacher training. A Committee of the Professors, with Donnelly, was set up to frame a prospectus for "The Normal School of Science and the School of Mines".[14]

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1 Cole MS Diary 11 December 1872
2 Ibid. 12 December 1872
3 P.M. 89, 15705 (23 December 1872)
4 Treasury Out Letters 7.9 15 191 13 August 1873
5 MS letter Donnelly to Huxley 14 August 1873
6 P.P. (1884) LXXIII (563) 8
7 D.S.A. 28th Report 556
8 Treasury Out Letters T.1. 6719
9 D.S.A. 28th Report xi
10 D.S.A. 25th Report 3
11 D.S.A. 28th Report xii
12 R.C.T.I. Second Report I 398
13 P.P. (1881) LXXIII(563)
14 Reeks op. cit. 114-115

Accommodation for the Museum of Practical Geology was one problem which delayed full transfer. As the collections were housed in 1881 they "could not be used without difficulty".[1] In that year the Department was criticised for "patching up the Museum ... and installing the electric light ... since it is not relaxing its efforts to remove it".[2] Donnelly made an unsuccessful attempt at transfer in 1885.[3] In fact, the Museum remained in Jermyn Street until the 1930's, when it was moved to its present site in South Kensington. Thus, the institution which was in one sense the fore-runner of the whole scheme of scientific instruction had to remain in an unsatisfactory condition longer than any other component of the complex.

The development of a "School of Science at South Kensington ... with a Council of Professors under a Dean as Chairman ... to advise my Lords" was sanctioned by Treasury letters in 1882.[4] The post of Dean was offered to Huxley,[5] and this title allayed the fears of one mother about his "notorious irreligiosity ... as she had no idea that there could be such a thing as a lay Dean".[6] The School of Mines was "affiliated to the Normal School of Science", and "only Mining" continued at Jermyn Street.[7] A "fully grown Normal Science School"[8], and "the reform which will produce science teacher's"[9] were welcomed, but the School, said Donnelly, was "not the outcome of a cut and dried scheme ... but has developed in the fullness of time".[10] There was now a proved need for trained Science teachers, and this must have been the prime consideration when the transfer to South Kensington was approved by the political chiefs.

xii) Relations with the Professors

Donnelly secured Cole's recommendation for the succession to his post on one count, at least, that he was "most competent to deal with the Professors".[11] Just at that time, one of these Professors, Percy, was annoyed when Donnelly, not Cole, replied to a letter about laboratory accommodation which had been addressed to the latter.[12] Percy's abrupt resignation in 1882, and the way in

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1 Hd. CCLVIII (1881) 1837-1838
2 Ath. 16 April 1881
3 MS letter Donnelly to Huxley 4 April 1885
4 D.S.A. 29th Report 428 (Letters of 2 June and 18th July 1882)
5 MS letter Spencer to Huxley 13 August 1881
6 H.G. Wells op. cit. I 175
7 D.S.A. 29th Report 428 and 319
8 N.A.P.S.S. 1883 Report 321
9 Nat. 27 October 1881
10 Ibid. 6 July 1882
11 Cole MS Diary 7 August 1872
12 MS letter Percy to Cole 6 August 1872 and MS letter Percy to Cole n.d. 187

which it provided the opportunity to go ahead with plans for the Normal School, have been noted. He defended the Department against criticisms by Lord Randolph Churchill, saying that it was "the very foundation of Technical Instruction".[1] However, he harboured a grudge which led to a black-balling by him of Donnelly's election[2] to the Athenaeum. When Donnelly made a second, and successful application,[3] Huxley noted that "Aberdare went for Percy by name"[4], and had said that "Percy should be kicked out of the Club".[5] Donnelly, however,believed that he had been elected with Percy's aid and that of "the lively Lockyer".[6] Percy's contributions, despite his personal quirks,[7] must not be overlooked. When he died, the Engineer recorded that "scarcely a chemist of note has not been his pupil".[8]

The Department's "control" was not always welcomed by other Professors. Huxley resented a letter from Forster, the Vice President, and a Minute on vivisection in the School, and said that while he did not use such methods himself, he was sure that when they were used in the School, conditions were always strictly controlled.[9] Huxley's old friend Frankland was in trouble with the Department from 1883 to 1886 when it was suggested that he was carrying out private analytical work and neglecting his students. (An early objection to the work of analysis for government Departments, which figured prominently in early Reports of work at the School of Mines[10],had been that this might interfere with the more purely educational aspects of its work, and would also lead to unfair competition with private enterprise.[11]) "Rumours of private work in the Chemistry laboratories" were passed on to Huxley by Donnelly,[12] and when the Dean asked Frankland for his views[13], he received an indignant denial.[14] A student charged neglect[15] and Huxley forwarded this letter to the Professor.[16] Donnelly wished to "avoid unpleasantness with our new Normal School or with our

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1 Times 27 October 1887, signed with his usual pseudonym of "T"
2 Huxley asked Playfair to support Donnelly's application in 1887 (MS letter 11 May 1887)
3 MS letters Huxley to Lockyer 2 February 1888 and Lockyer to Huxley 8 February 1888.
4 MS letter Huxley to Lockyer 14 February 1888.
5 MS letter Huxley to Lockyer 15 February 1888
6 MS letter Donnelly to Huxley 16 February 1888
7 He always refused the title of Professor and referred to himself as "Lecturer" (Engr. 28 June 1889)
8 Engg. 28 June 1889
9 MS.letter Huxley to Donnelly 12 February 1874
10 D.S.A. 3rd Report ix and 20, 8th Report 160 etc.
11 Engr. 25 June 1858
12 MS letter Donnelly to Huxley 13 February 1883
13 MS letter Huxley to Frankland 4 April 1883
14 MS letter Frankland to Huxley 16 April 1883
15 MS.letter Darroch to Huxley 3 May 1883
16 MS letter Huxley to Frankland 5 May 1883

old friend."[1] He was glad to submit Frankland's defence against the charges[2] to "My Lords".[3] There was a revival of accusations in 1884, and Huxley had to see Carlingford and Mundella, to assure them that all the chemist's time and energies were devoted to the School.[4] Dissatisfaction at the state of the Chemistry Department was expressed again in 1886,[5] but Huxley was satisfied with Frankland's defence, and he told Donnelly that he regretted having allowed himself to be influenced by the persistence with which the charges had been pressed.[6] No more was heard of the matter.

The Professors resented an attempt by the Department, which was eventually successful, to enforce the appointment of external examiners to act with them in the award of diplomas. Donnelly "wished to avoid a row"[7], but said that the original diploma scheme had envisaged such appointments.[8] The Professors were prepared to conform,[9] and Donnelly believed they "still have a pretty free hand."[10] "Godalmighty Professors and the black beetle official" were referred to by Donnelly later, when he said that "Lowe would have made them sit up", but he said that no direction was intended.[11] At the conclusion of the affair, when the appointment of conjoint examiners was announced[12], he told Huxley that he was sorry if the Professors were hurt,but that he "would do it again".[13]

These matters apart, relations between the Department and the Staff seem to have been amicable on the whole. The Department appears to have done little about the frequently expressed criticisms of the Mechanics' Department and its Professor, Goodeve. It was charged that that Department was "fossilised"[14], "disgraceful", and out of date,[15] and that Goodeve was "a mathematician only", whose lectures were "useless and rowdy"[16]. (Record has been made of criticisms of his examination papers).[17] The appointment of Perry as his successor seems to have stilled the criticisms that the course was "too theoretical" and must "rise above the design of clocks and watches."[18] There was a suggestion of

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1 MS letter Donnelly to Huxley 4 May 1883
2 MS letter Frankland to Huxley 27 June 1883
3 MS letter Donnelly to Huxley 2 July 1883
4 MS letter Huxley to Frankland 29 June 1884
5 MS letter Huxley to Frankland 19 June 1886
6 MS letter Huxley to Donnelly 20 June 1886
7 MS letter Donnelly to Huxley 19 March 1892
8 MS letter Donnelly to Huxley 19 March 1892 (second letter)
9 MS letter Macgregor to Huxley 28 March 1892
10 MS letter Donnelly to Huxley 20 April 1892
11 MS letter Donnelly to Huxley 25 May 1892
12 D.S.A. 40th Report xxi
13 MS letter Donnelly to Huxley 27 May 1892
14 Engr. 10 February 1893
15 Engg. 14 December 1894
16 Ibid. 26 April 1895
17 Chapter VI Section (k)(iv)
18 Engg. 4 January 1895

academic jealousy when Lockyer became Companion of Honour in 1893, and Donnelly had to ask Huxley to assure the other Professors that the appointment was not made on the Department's recommendation, but on that of Lord Kelvin, and that "Gladstone's Secretaries had bungled it".[1] Donnelly was able to use his influence to obtain permission for the Professors to wear Civil Service uniforms on State occasions, which gladdened the heart of Lockyer at least.[2] There was a well-established custom whereby Donnelly and the Professors met regularly for luncheon in the Museum restaurant, and Huxley was "out of heart to think of the end of our lunches in that sacred corner" on his retirement.[3]

xiii) Later developments

The development of the teacher training courses at the Normal School is more correctly dealt with later,[4] but brief comments will now be made on general developments in the period after the "full transfer" from Jermyn Street, which had been completed by 1890.[5] The School was not confined to "masters in training". Private students' applications were so numerous by 1887 that a selection procedure was initiated, on the basis of previous examination results and testimonials.[6] The rule that candidates for the diploma must follow a basic science course in their first year was rescinded in 1889 "because of the great advances in elementary science teaching".[7] Further entrance requirements imposed in 1890 were welcomed as proof of the School's popularity.[8] The Department was proud of the research carried on, and published frequent accounts.[9] (It had of course been at the old College of Chemistry that the young W.H.Perkin, working under Hofmann, had made the discovery of aniline dyes[10] which made his fortune, although it was most fully exploited by the German chemical industry). Too many students went on to research "at the public expense", said some critics, and this was "unlikely to be of value to teachers of artisans."[11] Some of the Associates became "useless encumbrances to Engineering", or they "took up teaching and perpetuated the system which had been their own destruction", believed others.[12]

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1 MS letter Donnelly to Huxley 2 January 1893
2 T.M. and W.L. Lockyer op.cit. 195
3 Reeks op.cit. 130 (This letter is not in the Huxley Correspondence).
4 Chapter XI Section (B)(e)(i) and (ii)
5 Centenary of the Royal School of Mines 21
6 D.S.A. 34th Report 17 and announcements in Nat. 20 January 1887 and Engr. 21 January 1887
7 D.S.A. 36th Report xvii
8 S. and A. December 1890
9 D.S.A. 23rd Report 471, 27th Report 82-86, 28th Report 57, 30th Report 337, 32nd Report 185, 35th Report 36-38
10 D.S.A. 6th Report 49
11 Engr. 10 February 1893
12 Ibid. 7 December 1894

Another cause of opposition in the earliest days of the "new" School were fears that it would attract students from other institutions which did not receive state aid,[1] but the Department argued that it selected its students by competitive examination from Science Schools throughout the Kingdom, and that fees were "high enough to prevent undue competition".[2] Indeed, private students were only allowed to enter if they did not keep out scholarship students.[3] Frankland charged in 1876 that a clause to this effect in the Prospectus of that year had caused a fall in entries.[4] In 1882 he said that entrants were being deterred by the high fees, and implied that Donnelly was responsible for these.[5] He found a supporter seven years later in Bartley.[6] Fees cannot, however, have been unduly high. One M.P. suggested in 1895 that fees were so small as to justify completely free admission.[7] Figures of costs quoted in Engineering in 1898 showed that the School, with an average per capita cost of £57, compared unfavourably with the City and Guilds' £31, the Zurich Institute's £50, and the M.I.T.'s £22.[8]

xiv) Problems of accommodation

Even when the School was moved to South Kensington, accommodation was never really adequate. "The government must either spend money on the School or abolish it", said Nature in 1887.[9] The periodical welcomed a Commons question by Roscoe in 1888[10] when he said that the fact that Physics instruction had to be carried on in a temporary building "would not be tolerated in a third rate German town".[11] "The grievously unsatisfactory state of the buildings, which if inspected by an Elementary School Inspector would cause the withdrawal of grant", alarmed Acland in 1889.[12] Roscoe called the accommodation "a disgrace to England" on the same occasion, and said that Frankland was ashamed to take students' fees.[13] The laboratory accommodation was "beneath contempt" in 1891,[14] and Playfair called for expansion in 1892.[15] Accommodation was "disgraceful" in

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1 R.C.T.I. A. 2742 (W.G.Adams)
2 D.S.A. 29th Report 428
3 P.P. 1881 LXXIII (563) 14
4 D.S.A. 23rd Report 470
5 MS letter Frankland to Huxley 11 October 1882
6 Hd. CCCXXXV (1889) 27
7 Hd. XXXVI (1895) 1049
8 Engg. 22 January 1898
9 Nat. 24 March 1887
10 Hd. CCCXXIV (1888) 611-612
11 Nat. 12 April 1888
12 Hd. CCCXXXV (1889) 24
13 Ibid. 26
14 Nat. 21 May 1891
15 Ibid. 14 January 1892

1893.[1] The whole question of expansion had to be seen against the wider plans for the improvement of the Museum and administrative buildings. £100,000 was voted for land and buildings in 1890,[2] not without opposition, but estimates had risen to £400,000 by 1893.[3]

An additional threat was posed by a plan to construct an underground railway which would run beneath the School.[4] The Professors were "taking up an impossible attitude", believed Donnelly. "Set up a Science School in the middle of a large town and you must take the consequences", he thought.[5] The scheme met concerted opposition in 1893,[6] and Nature reported its unanimous rejection by a Select Committee of the House of Commons in that year with the comment that "Science has been in jeopardy through practical applications of itself".[7] The railway was diverted and no more was heard of the scheme.

The School was still "excessively cramped for space", and "scattered quarters cut efficiency" in 1893.[8] Accommodation was a "scandal" in 1897,[9] and the position was "desperate" in 1898.[10] Eventually, Parliamentary approval for large scale building schemes was obtained, but Nature feared that the expansion of the School, by then the Royal College of Science, would wreck the plans for a Science Museum.[11] The provision of satisfactory accommodation had to wait until the new century.

xv) The Royal College of Science

"The Royal College of Science, London", was the title granted to the School in December 1890, when the "Queen graciously acceded to the Royal prefix". The new title was asked for, and granted, "because there were other curricula besides Mining".[12] The change was welcomed. (One old student, it was said, had once been asked "if the old Normal School was a higher grade school".[13]) The time had come to unite all the South Kensington science teaching institutions and to connect them with the University of London, suggested Philip Magnus in 1898.[14] The Royal College of Science became a School of the newly re-organised University in the first year of the new century,[15] by which time the Department

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1 Hd. XII (1893) 1314 (Smith)
2 Hd. CCCXLI (1890) 1187-1204
3 Hd. VIII (1893) 532
4 Nat. 18 December 1890 and Times 22 January 1891
5 MS letter Donnelly to Huxley 8 January 1891 (Catalogued as 1881)
6 Nat. 5 January 1893
7 Ibid 23 March 1893
8 D.S.A. 43rd Report xxiii
9 Engr. 5 February 1897
10 Nat. 24 March 1898
11 Ibid. 18 May 1899
12 D.S.A. 36th Report 222
13 S. and A. December 1890
14 Nat. 10 May 1898
15 Ibid. 10 October 1901

which had given it existence had itself come to an end. The teacher training function had begun to lapse in the final years under the Department: the amalgamation with the "rival" institutions promoted initially by the City and Guilds, to form the Imperial College of Science and Technology, would be a feature of later years, but once more, the Department had erected a foundation on which later efforts could build.

b) The Royal School of Naval Architecture

i) The inception of the scheme

"Plans for a Naval College", where the principles of naval construction should be taught, were discussed by Cole and his old friend John Scott Russell when they dined together in 1863, and Cole, of course, "advised payment on results".[1] The Admiralty was interested in the formation of a third School, after two previous failures at Portsmouth in the earlier years of the century.[2] Cole talked over the scheme with Russell and Woolley,[3] now an H.M.I., and former Principal of the second School during its brief existence.[4] "They might have old buildings, and ... we ... responsible for management", he told them.[5] (The "old buildings" were those eventually vacated by the School of Art in 1864). The Admiralty Officials were adamant that Russell must have nothing to do with the proposed School, Cole was told.[6] The government had chosen the Department, not the Admiralty, to manage the School, Cole learned from an Admiral, because they were "incompetent ... and would be sure to be a failure".[7] Woolley should be "Inspector-General" of the School, it was agreed.[8]

Lowe was against an Admiralty "monopoly" for their apprentices,[9] presumably so that the School might to some measure be self-supporting from private students' fees. C.W. Merrifield was appointed Principal, responsible for "discipline and instruction", to Woolley, who, as Inspector-General, was also Director of Studies, in charge of "organisation, general direction and Superintendence".[10] After Cole had told the latter bluntly that "he would not be Principal in any case"[11]. This arrangement was not without attendant difficulties,

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1 Cole MS Diary 10 April 1863
2 Nat. 8 May 1884
3 Biographical Appendix
4 Times Obituary of Woolley 26 March 1884
5 Cole MS Diary 7 May 1863
6 Ibid. 13 September 1863
7 Ibid. 7 January 1864
8 Ibid. 4 February 1864
9 Ibid. 5 February 1864
10 MS.M 18.199 29 October 1864
11 Cole MS Diary 7 July 1864

Cole had to persuade Woolley not to resign on one occasion.[1] The Admiralty bore the expenses of its apprentices.[2] The three-year course was drawn up by Donnelly and Woolley, and it included a basic course in "pure Science", an emphasis on Mathematics, and a stress in its later part on practical construction.[3] Fellowships and Graduateships of the School were awarded by examination. (These were equated with Honours and Ordinary degrees by the Engineer[4]). A novel and possibly original feature of the course was that six months of each year would be spent in the Royal Dockyards[5]: this could be seen as the first "sandwich scheme".

ii) The brief life of the School

Numbers increased steadily[6] after the School opened with 22 students, of whom six were "private" students, on 1 November 1864.[7] The total, however, never reached the figure of 30 which was originally planned. Foreign students were allowed to enrol, but were not permitted to enter the Admiralty dockyards until 1870.[8] New buildings, at a planned cost of £28,000,[9] were initiated in 1867, and laboratories and lecture theatres were included.[10] There were some doubts about the permanence of the School in 1866,[11] but these were resolved.[12] Even an average of 47 hours of lecture time per student per week was not thought to be enough after the first examinations for the Diploma, and a fourth year was added to the course, and theoretical instruction in each year carried into a seventh month, in 1870.[13]

Despite the steady admission of students, however, "few of the gentlemen connected with the private profession (of shipbuilding) availed themselves of the School".[14] A depression in the shipbuilding industry did not help matters. There were rumours of a move of the School to Greenwich in 1872.[15] This was seen "not as an evidence of decline, but of the government's recognition of value", by Merrifield.[16] "A treaty of peace to transfer the School" was

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1 Cole MS Diary 22 September 1865
2 D.S.A. 11th Report viii
3 D.S.A. 12th Report 67-70
4 Engr. 23 August 1867
5 D.S.A. 12th Report 83-85
6 Table XXII
7 D.S.A. 12th Report ix
8 D.S.A. 18th Report xii
9 Engr. 3 August 1866
10 D.S.A. 14th Report xiii
11 Cole MS Diary 8 November 1866
12 Ibid. 5 December 1866
13 D.S.A. 16th Report x
14 D.S.A. 19th Report 209
15 Cole MS Diary 5 March 1872
16 Engr. 2 May 1872.

opened by the Admiralty in that year.[1] The Admiralty had been completely satisfied with its administration, said the Department, but a new Royal Naval College was to be opened at Greenwich "as the best place for instruction",and the Kensington School would be closed.[2] An Order in Council of 16 January 1873 brought the end of the Kensington venture in May of that year.[3] Private students, including foreigners, continued to be "welcomed".[4]

iii) The value of the School

A Museum of Naval Models was opened at Kensington as an adjunct to the School, and it was noted that nearly every owner of an exhibit declined to allow a transfer to Greenwich.[5] "The great majority of the rising men in the profession" were later claimed as products of the Kensington school.[6] The Department appears to have had no great control of the courses of instruction, and the failure, if there was one[7], lay in the lack of support by private shipbuilders. The School is of interest on two counts, as an example of the way in which the Department was prepared to shoulder any responsibility, and as an illustration of the way in which it could encourage "practical" and "professional" applications of studies while stressing in other fields that this was not the concern of a government department. The "sandwich course" innovation is of interest, and the "new buildings" were no embarrassment, but rather an advantage, providing as they did accommodation for the Jermyn Street institution when it first was transferred to South Kensington.

c) The Science Collections

i) Provincial Museums

The Department controlled the Edinburgh Museum of Science and Art. This had been originally established as a Natural History Museum in connection with the University in 1812, and it was transferred to the Department in May 1855.[8] A new building to designs by Fowke was proposed that year, and it was eventually opened in 1863.[9] The Museum came under the control of the Science section,at Cole's wish.[10] Archer, the Director from 1860 to 1885, a "well informed bore with his knowledge"[11],had been a Liverpool customs clerk, and had come to the

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1 Cole MS Diary 22 November 1872
2 D.S.A. 20th Report xiii
3 D.S.A. 21st Report xi
4 Nat. 8 May 1884
5 D.S.A. 35th Report xxiii
6 Ibid. xxxv
7 It was so described in a letter to the Engineer on 5 February 1897
8 D.S.A. 2nd Report xxxvii
9 D.S.A. 12th Report xx
10 S.C.S.I. AA. 2893-2894 (Cunliffe Owen)
11 Cole MS Diary 11 June 1870

Department's attention at the time of the Great Exhibition.[1] "A Captain of Engineers, however brilliant, residing in London, cannot satisfactorily conduct ... the Museum ... through an uneducated and utterly irresponsible ex-exciseman, however bumptious", believed Huxley's friend, Wyville Thomson, for unspecified reasons, in 1871.[2] There was a belief in Edinburgh that Archer had "a compromising letter which puts the Department in his power", he added later, and he threatened to start a campaign for a new and independent Museum if there continued to be "a doctrinaire style of management from South Kensington".[3]

The Museum had laboratories, and students from University used these, and the collections.[4] The Natural History collection would appear to have been its most important feature.[5] Under Murchison Smith, who became Director on Archer's death, the Museum would appear to have been organised in a way which made it more acceptable to the locality.

The Department also controlled a Museum in Dublin, and had a long and complicated history in its dealings with the Royal Dublin Society, which had originated the collections, until a special Act of Parliament was passed in 1877.[6] The role of the Society's "visitors" caused much trouble, but the Society was eventually satisfied on this point.[7] Disputes over the site and cost of a new Museum were many,[8] but a new building was opened in 1890.[9]

The Museums Committee in 1898 said that both these Museums "suffered from the centralising tendency", and Donnelly was criticised after he had admitted that he rarely visited them.[10] In general, they would appear to have developed largely in response to local needs and because of local endeavours, and not necessarily as instruments of central policy.

ii) <u>First steps for a South Kensington collection</u>

A "Museum of Machines" was referred to by Disraeli in his speech on the proposals for the "Industrial University" in 1852,[11] and "a metropolitan establishment of a collection of models" was included in the proposals to the Treasury on the foundation of the Department in 1853.[12] A collection of

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1 Boas <u>op. cit.</u>
2 <u>MS</u> letter Wyville Thomson to Huxley 13 October 1871
3 " " " " " " 19 May 1873
4 <u>D.S.A. 5th Report</u> 11
5 <u>MS</u> letter Playfair to Cole 4 February 1863 and draft <u>MS</u> letter Cole to Playfair undated.
6 <u>D.S.A. 25th Report</u> xix
7 <u>D.S.A. 34th Report</u> 29-32, xxxix, <u>37th Report</u> xi, 329
8 <u>D.S.A. 25th Report</u> xix, and frequent references in <u>Hansard</u>
9 <u>D.S.A. 38th Report</u> xlvi
10 <u>S.C.M. 1898</u> A. 569 (Donnelly) and xxiii
11 <u>Hd.</u> CXXIII (1852) 1025
12 <u>D.S.A. 1st Report</u> Appx.I

Animal Products was formed and shown at the Society of Arts in 1855, and then made over to the Department.[1] (It was eventually to find a home in the Bethnal Green Museum).[2] A "Museum of Science" was proposed by Donnelly in 1865,[3] and he was asked to submit his ideas to the Board.[4] While it was claimed that "hardly an object in the collections does not embrace science and art"[5], a separate collection of "Models and Machinery" was set up in 1869.[6]

iii) Proposals for a Science Museum

The Royal Commission on Scientific Instruction heard evidence on the value, in their industrial applications, of scientific collections[7], and recommended the setting up of a "Science Museum in the Metropolis".[8] The bid for the control of such a Museum by the Department, in the International Loan Exhibition of 1876, and its comparative failure, has been recorded,[9] and there was a lapse of some years before the question was raised again. (The Commissioners offered land and £100,000 for a Science Museum at this time, charged Nature, later, and the land had eventually to be bought.)[10] Negotiations with the Patent Office for the acquisition of its collections, which had been temporarily housed at Kensington in "disgusting" conditions since 1872[11], brought a transfer to the Department in 1883.[12] The Department was given power to call on patentees for models of their inventions.[13]

"I am getting on swimmingly with Lingen on the scheme for a Science Museum", Donnelly told Huxley, hopefully, in 1883.[14] However, when a Committee was formed,[15] only the Chairman, Bramwell, was "a tower of strength", and Lingen's "simple ignorant cussedness" appalled Donnelly, who feared that "the enemy are going to kill us with kindness ... £390,000 offered. £50,000 would have done for me! "[16] Before the publication of the Committee's Report, a second "International Inventions Exhibition" was held at South Kensington.

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1 Ath. 19 February 1855
2 Hudson and Luckhurst op. cit. 217
3 D.S.A. 12th Report x
4 MS letter Cowper to Cole 16 June 1865
5 S.C.S.I. A. 866 (Cole)
6 D.S.A. 16th Report xviii
7 R.C.S.I. A.9220 (W.G. Armstrong)
8 Ibid. Fourth Report 13 sec.82 and 14 sec. 93.
9 Chapter IV Section (c)
10 Nat. 30 April 1891
11 Engg. 9 February 1872. A suggestion had been made in 1872 that patent fees should be used to set up a good Science Museum (Engr. 8 November 1872) and Cole was a member of a deputation from the Society of Arts to the Lord Chancellor on the subject in 1874. (Engr. 23 January 1874 and Cole MS Diary 17 January 1874)
12 D.S.A. 29th Report xxvii and D.S.A. 31st Report xix
13 Nat. 19 April 1883
14 MS letter Donnelly to Huxley 13 January 1883
15 Nat. 19 March 1885
16 MS letter Donnelly to Huxley 13 February 1885.

It was a private venture, and a disastrous fire caused £1,000,000 worth of destruction, including some damage to the Museum.[1] Accommodation problems increased. While the Patent Museum acquisitions were "weeded out", the Department admitted that the collections were still "incomplete, disjointed and unsystematic".[2]

The Committee voted five to one for a separate Science collection.[3] There would be an outlay of three quarters of a million pounds, charged the Engineer, before the Report came out.[4] A cartoon of "Science" pleading with "John Bull" for her own Museum was published by Punch.[5] There were no immediate consequences, since "the government had no intention of incurring the expenses involved, £220,000".[6] The "outrageous" actions of the Treasury in sending a circular to members of another Committee, without sending a copy to the Department, annoyed Donnelly in 1889,[7] and he submitted a memorandum of his own.[8] As a result of the Committee's recommendations for separate accommodation[9], land was purchased in 1890.[10] An offer by Tate, the sugar merchant, to provide a Gallery of British Art as South Kensington threatened the scheme for a time. The "pressure of the Science Museum advocates", who presented petitions,[11] made up deputations,[12] and asked questions in the House,[13] finally carried the day.[14] The "tunnel like edifice" of the East and West Galleries of the Museum was refused by Tate as a home for his Gallery,[15] and the scheme was dropped.[16]

iv) Delays in schemes for development

Patent fees as a sourse of expenditure were suggested again in 1892,[17] but the delay in the scheme for re-building the whole Museum held up developments. The Committees on the Museums of the Department heard strong arguments

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1 Ath. 20 June 1885
2 D.S.A. 33rd Report xvii and 34th Report xxxi
3 Nat. 13 and 20 January 1887. The one dissentient, Mitford, was a man who "regarded all things great and small with a genuine conservatism" and "to the end of his days wore the old fashioned tail coat and brass buttons of a previous generation". (D.N.B.) (See also P.P. 1886 LI 935)
4 Engr. 20 August 1886
5 Pch. 6 August 1887
6 Hd. CCXI (1887) 1396 (Goschen)
7 MS letter Donnelly to Huxley 25 April 1889
8 Nat. 2 May 1889
9 Ibid. 20 August 1889 and P.P. 1889 XXXIV (281)
10 Ibid. 6 March 1890
11 Ibid. 23 April 1891
12 Ibid. 30 April 1891
13 Hd. CCLI 1424-1425 (Roscoe)
14 Art J. 1892 126
15 Nat. 10 March 1892 It eventually found a home on its present site on the Embankment.
16 Hd. II (1892) 165-168 (Goschen)
17 Nat. 25 March 1892

for improved accommodation.[1] The Science collections shared in the general improvements after this period, but they were not housed in a separate, specially erected building until after the end of the Department's existence. There seems little doubt that the acquisitiveness shown by officials of the Department, which will be noted with reference to the Art collections, did not help in the matter of accommodation. The "Buckland Fish Collection" is a case in point. Bequeathed in 1882, with a sum for its maintenance,[2] it was never properly displayed[3] or efficiently organised, although efforts were made to utilise it.[4] Recommendations for its dispersal were inoperative, since no one would accept it[5], and negotiations for the transfer of the trust were made difficult by the embezzlements of one of the trustees.[6] The question was still in Chancery at the end of the period.[7] The collections, however, seem to have served their purpose, and even when accommodation was at its worst, the Head of the Royal College of Science said that full benefits were being received.[8]

v) Officials

Playfair's duties in connection with the Food and Animal Products collections have been recorded.[9] An unsuccessful attempt to persuade Huxley to take on these responsibilities, as Playfair's successor,[10] was followed by the appointment of a Dr. Lankester, on a six months contract.[11] His services were eventually dispensed with because of the "unsatisfactory nature" of his work.[12] (His dismissal as Examiner has also been recorded.[13])

The responsibility for the growing Science collections was eventually exercised, under Cunliffe Owen, by the Royal Engineer, E.R. Festing. When Owen retired, the division between the Science and Art collections, even though they were still housed in the same buildings, gave Festing the sole responsibility for Science.[14] He continued in that position after the Department's separate existence came to an end.

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1 S.C.M. (1897) A. 1119 (Lockyer) and S.C.M. (1898) A. 736 (Festing)
2 D.S.A. 30th Report xxii
3 Nat. 24 April 1885 and Hd. XII (1893) 1263
4 Nat. 29 October, 26 November, 3 December 1885
5 Ibid. 29 August 1889
6 S.C.M. (1897) AA. 918-921 (Donnelly)
7 Hd. LXXI (1900) 322-323
8 S.C.M. (1898) AA. 933-934 (Judd)
9 Chapter II Section (b)(ii)
10 Cole MS Diary 4 June 1858
11 MS.M 9.60 (16 October 1858)
12 Ibid. 16.30 and 176 (March and July 1863)
13 Chapter VI Section (e)
14 D.S.A.O.B. 9 July 1893

vi) General value

It is suggested that the Science collections never achieved their full share of attention because the value of the direct application of their exhibits was not so easily demonstrated as was the case with Art. A further factor must have been that it could not so easily be shown that purchases had an "investment" value. The Natural History Museum, which remained under the control of the British Museum even when it was sited at South Kensington, it could be argued, provided material for the natural scientists. The physical scientists had to wait until the present century for similar provision.

CHAPTER EIGHT

THE DEVELOPMENT OF FACILITIES FOR THE TEACHING OF ART

a) The foundations of the scheme

i) Primary objectives

ii) The basis of courses of study

iii) Theory: Redgrave's contribution

iv) Organisation: Cole's contribution

b) The provincial Schools of Art

i) Basic organisation

ii) Objections to centralisation

iii) General growth

iv) The full introduction of payment on results

v) The consequences of payment on results

vi) The Manchester School of Art

vii) The last years of the provincial Schools

c) The elementary schools

i) The initial schemes

ii) Changes with experience

iii) Growing criticisms

iv) Later developments

d) The place of "Design"

i) Initial premises

ii) Early developments

iii) Growing demands for direct "trade" instruction

iv) The influence of "Design" on manufactures

e) Reactions to the system

i) Ruskin's opposition

ii) Major criticisms

iii) Defences and responses

a) The foundations of the scheme

i) Primary objectives

There were four main objectives in this field, First, the "taste" of the nation was to be developed, by improved general education which would ultimately enable the community to adopt higher standards. Secondly, there had to be better specialised education of the designers who would produce the "superior" goods which this improved taste would demand. Thirdly, as agents in these preceding tasks, sources of inspiration and models for improved techniques were to be provided in freely accessible Museums, central and local. Fourthly, the teachers who would raise the standards, general and specific, had to be trained. All this was to be done in ways which would aid without sapping initiative, and would ensure maximum effect for expenditure involved.

"Our work is a fight against national ignorance in Art, to be won by persuasion and reason", said Cole.[1] The "dissemination of principles connecting Art with beauty, taste and truth",were the main objectives in this work, believed Redgrave.[2] "All classes" would be "induced to investigate the common principles of taste".[3] It was "a mockery to train designers unless the consumers are educated", thought Cole,and he believed that if it came to a choice, the education of the general public, rather than the training of specialists, should be undertaken, for that reason.[4]

ii) The basis of courses of study

Although Granville later warned Cole "not to be too dictatorial on taste",[5] Cole and Redgrave believed that "rules of taste" could be defined, and set out to develop courses and institutions which would assist in the achievement of their aims. Cole developed the regulations for the practice: the theorist was Redgrave. Drawing was to be the basis on which painting and modelling would later develop. "Characteristic generalisation, not imitation, based on Nature, and basically symmetrical",would be developed.[6] Courses in the Schools would be based on the six certificate stages of the course of teacher training,[7] but these courses were to act as "rules, not fetters".[8] Practice in drawing was seen as of greatest value in the development of "hand

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1 Address of November 1852
2 Address of November 1853
3 D.P.A. 1st Report 2
4 Address of June 1852
5 Cole MS Diary 21 October 1857
6 Redgrave Address of October 1853
7 D.S.A. 1st Report 115 and 2nd Report 71
8 Redgrave Address of October 1853

and eye" co-ordination: this provides a sound example of the belief of the time in transfer of training, and in the faculty concept. It "encouraged observation and an appreciation of proportion", could be used as a kind of "short-hand", and would "develop habits of neatness and conciseness".[1] Its study had, of course, an additional advantage, that it needed little in the way of materials for its development. The Schools of Design should have been called "Schools of Drawing" from the outset, argued Cole: their title was a mis-translation of the French "Ecoles de Dessin",[2] and this emphasis on drawing as a foundation for their work was really a reiteration of their basic function.

iii) Theory: Redgrave's contribution

"Fitness" was a major feature of Redgrave's credo. "Fitness, utility, and the enrichment of essential composition", were his rules,[3] and he had criticised a Great Exhibition exhibit, a table whose legs were formed in a design of swans' necks, not because it was cumbersome, but because he was "perplexed to know why swans should make their nest under a table at the risk of having their necks broken".[4] It has been argued that Cole took over this precept, and that he is the "third person" who lays down "fact as a basis of design" in Dickens' Hard Times ("No flowers on carpets").[5] Redgrave's comments on items submitted to Annual Exhibitions of students' work reveal his beliefs. "Severe and imitative treatment" was preferred to the "facile and florid".[6] "Precision, exactness, correct appreciation and imitation of form: careful and severe training and the inculcation of right principles" were stressed.[7] "The faithful rendering of natural forms" was praised.[8] "A regular course from straight lines ... to practical geometry and perspective" was favoured in the elementary schools.[9] With this training, Cole and Redgrave argued, the objectives would be achieved. Although later developments allowed more stress to be placed on painting, figure work, and modelling, drawing remained as the basis of the work in the Schools.

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1 Cole and Redgrave found powerful supporters whose speeches were published in Science and Art Addresses 1852-1858. They included Ruskin, Granville, Cowper and Burchett.
2 Cole op.cit. I 181
3 N.Pevsner High Victorian Design (London Architectural Press 1951) 140
4 J.C.Buckley The Victorian Temper (London Allen and Unwin 1952) 133
5 K.J.Fielding Charles Dickens and the Department of Practical Art - Modern Language Review XLVIII (Cambridge January 1953) 272-277
6 D.S.A. 1st Report 359
7 Ibid. 366
8 D.S.A. 3rd Report 241
9 D.S.A. 1st Report 64

iv) Organisation: Cole's contribution

One of Cole's major criticisms of the old Schools of Design had been their "lack of organisation". He set out to develop a system which, while he frequently claimed that it left full initiative in the hands of local interests, became more centralised and regulated with time. He acknowledged from the outset that the system would be experimental, that "mistakes" were to be expected, and that arrangements were far from complete.[1] The system was based on three main types of instructional institution, the Central School, the local Schools of Art, and the elementary schools, and on the Museums which would inspire both general public and specialists. Developments in the first and last of these are detailed separately, as part of the "South Kensington Art complex".[2] Progress in the other types of institution will now be considered.

b) The provincial Schools of Art

i) Basic organisation

The old Schools of Design, initially renamed Schools of Practical Art, and then known simply as Schools of Art, were designed for the training of students to meet specialised local needs. Teachers would be trained by, and would receive part of their remuneration from, the Department. "Independence" of central control was frequently repeated. It was stressed that the locality should be sole judge of local needs, and "the advice of the central Department sought only when desired";[3] "complete independence" was avowedly preferred, measures were designed to that end,and support would be limited to aid towards costs of instruction.[4] Precise regulations were laid down on the constitution of the Local Committee which would administer the School: one condition of aid was the provision of premises, and accommodation and equipment requirements were carefully stated, even to the tint of drawing paper (green or "neutral").[5] Schools were in fact helped in other ways besides assistance given with salaries. Part of the purchase cost of approved casts was met,[6] duplicates from the Museum would be supplied at half cost[7] (although not a single school

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1 D.P.A. 1st Report and Address of November 1852
2 Chapter IX
3 D.S.A. 1st Report xxv
4 Ibid. 133-135
5 Ibid. 108
6 D.S.A. 2nd Report 18-20
7 D.P.A. 1st Report 16

used this facility in the first ten years[1]) masters were assisted with the expenses of visits to the central Museum[2], and loans were available from that Museum. Students were encouraged by the award of bronze medallions[3], "prize studentships" were instituted[4], and scholarships to the Central School were available.[5]

Local Exhibitions of students' work were encouraged during the Summer vacation.[6] Central Exhibitions of work from the provinces had first been arranged in April 1851, after much clamour from the Journal of Design[7], and they were an important feature under the new regime. Schools were required to submit works to Central Exhibitions, because this would "put them to the severe test of public examination... and (also) instruct the public".[8] The success of the first of these Exhibitions in 1852 reduced the virulence of the Art Journal for a time.[9] The requirement should be operated more stringently, argued Redgrave.[10] In 1855, National Medals, up to a limit of 100, were first awarded, and Schools at which successful students had studied could select works of Art to the value of £10 "as a nucleus of a local Art Museum".[11] This scheme was the seed of the system of "payment on results", as will be seen.

While the Department claimed that it was granting greater freedom, it required a quarterly return of fees, "works executed", and details of work in elementary schools[12], and an Annual Report.[13] It also required details of membership of the Committee, changes of accommodation, library and Museum facilities, and the ages and occupations of students.[14] There was a most important condition that there had to be teaching by the master in the classes of local elementary schools. This was to become the most resented single feature of policy in the early days, although this received little public expression in the very first years. ("Teaching in Parish Schools" was resented by a York Committee member in 1854.[15]) The "guaranteed salaries" of the masters who remained from the old Schools of Design caused difficulties. Members of

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1 S.C.S.A. A. 4336 (Cole)
2 D.P.A. 1st Report 143
3 Ibid. 41
4 D.S.A. 2nd Report 41
5 Cole MS Diary 24 December 1853
6 D.P.A. 1st Report 15
7 J. of D. April 1851
8 D.S.A. 1st Report lx
9 Art J. June, July 1852
10 D.S.A. 1st Report 359
11 D.S.A. 3rd Report xxiii
12 D.S.A. 1st Report 141 and 133
13 Ibid. 123
14 Ibid. 145-149
15 Cole MS Diary 11 December 1854

Local Committeeseither felt that they were in a false position if the "guaranteed salary" continued only if an unsatisfactory master remained[1], or resisted attempts made by the Department to oust such an incumbent.[2]

ii) Objections to centralisation

Despite the Department's claims on independence, many Committees resented central direction. The Potteries Committee, for example, objected strongly to being told that a number of schools in that area must be replaced by one Central School at Stoke.[3]

Cole spent much time in these early years travelling the country, and his Diaries contain many comments which recorded his progress. Thus,"raise fees" is noted for Birmingham[4], "Nottingham objected but agreed" on this matter,[5] while Worcester "agreed without comment".[6] Some local interests were afraid of connections with the Department. Representatives of the long-established Edinburgh Art School "expressed alarm" at suggestions that the Department planned to establish a School there[7], but eventually became connected themselves. Glasgow was "against support",but "meant well"[8], and also became connected later. The Finsbury School, after attempts to continue independently, reluctantly became connected.[9]

Some Schools closed rather than submit to "direction": the "impracticable rules" caused Belfast to close in January 1855.[10] (It re-opened a year later as a "new" School[11], but closed again in 1858 for a long time). Limerick closed because of "restrictive surveillance".[12] The Art Journal led the campaign against the Department,which began in 1855,and wanted "local Schools to rule with the Department, not be ruled by it".[13] It said that the Schools were in a "state of inanimation" because Cole and Redgrave were away in Paris for the Exhibition of that year.[14] ("Provincial agitation" was reported by

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1 Art J. August 1854
2 Cole MS Diary 29 November 1854 (Nottingham)
3 Ibid. 23 March and 2, 12 December 1854
4 Ibid. 16 December 1852
5 Ibid. 17 December 1852
6 Ibid. 9 May 1853
7 Ibid. 9 February 1854
8 MS letter Playfair to Cole 6 July 1853
9 Art J. February 1854
10 Ibid. January 1855
11 Engr. 25 January 1856
12 Art J. February 1855
13 Ibid. January 1855
14 Ibid. December 1855

Playfair.[1]) In 1857, Cole "repudiated" the suggestion of the Chairman of the Stoke Committee that "all the Schools were dissatisfied, and challenged him to have a Committee of Enquiry".[2] (He was to get it, seven years later). There were "demonstrations by masters against the obnoxious regulations" later that year,[3] but agitation seems to have subsided from that point, only to rise again in the next decade.

iii) General growth

The numbers of Schools, students, and the amount paid in fees increased steadily,[4] to a point in 1864 where Cole claimed that over 30% of the population had ready access to local Schools.[5] Only one witness before the 1864 Committee, C.H.Wilson, a former Director of the central School of Design and a long-time opponent, believed that "the establishment was too gigantic ... and there were too many Schools.[6] Fourteen schools closed in the period 1854-63, mainly for want of local support,[7] although the Department withdrew its aid if they infringed its regulations,[8] and Cole estimated a "95% success rate".[9] When the volunteer movement "attracted skilled artisans in the evenings" (during a period of fear of war with France) in 1860, there was a temporary decline in attendances.[10] The Department then sent copies of the Art Directory to all towns with a population over 15,000 where Schools had not been founded. "The Directory, Circulars, advertisements," were used to publicise aid: Cole doubted "if the Department could be any more delicate of attention if localities do not think they are coaxed enough".[11]

Premises were "the greatest drawback to success, and often preclude opening at all".[12] Building grants, to avoid the "crying evil of rent" were favoured by Cole, and he argued that if the acceptance of advice were a condition of grant, "buildings would be saved from becoming abortions".[13] Grants were made available from 1859, and increased in 1863:[14] only eight schools had been built with their aid by 1864.[15] Such grants were abolished as a consequence of the recommendations of the 1864 Committee[16], but resumed following

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1 MS letter Playfair to Cole 1 May 1855
2 Cole MS Diary 28 January 1857
3 Engr. 4 December 1857
4 Tables II and XVIII
5 S.C.S.A. A. 4316
6 Ibid. A. 2591
7 Ibid. Appendix
8 D.S.A. 10th Report viii
9 S.C.S.A. A.529
10 D.S.A. 8th Report 9
11 S.C.S.A. A.421
12 D.S.A. 6th Report 13
13 S.C.S.A. AA. 532 and 4560
14 D.S.A. 7th Report 18-19 and 11th Report
15 S.C.S.A. Appendix
16 D.S.A. 12th Report xiii

memorials from M.P.s and the Society of Arts[1], and extended in 1868.[2] They were never fully utilised by localities. This was due to "apathy", Cole believed,[3] but the chief cause was probably that the fitting out of the building was the full responsibility of the locality.[4]

iv) The full introduction of payment on results

The Local Committees fought strenuously on behalf of the masters,who were bitterly opposed to the changes brought about with the full introduction of "payment on results" in 1863. The cry of "provincial starvation"[5] was raised by the Art Journal, which said that at least twenty Committees had demanded an Enquiry,[6] and it later suggested that the real reason for the changes was that "Art is now going to be sacrificed to Science".[7] Two provincial deputations were received by Granville. (On the second occasion, Cole noted "All for capitation, building grants without control, and the lay element in awarding national prizes".[8]) Before the Select Committee, the main provincial charges were that the Department was promulgating an unjust and unworkable system, that there would be over regulation of courses, and that past experience had shown that changes in regulations were made without warning. "Endless regulations" led to "routine and mannerism", they were "a complete absurdity" and would "lend to neglect of the duller pupil", the system was "utterly impossible to operate", "outrageous and damaging".[9] Students would be "prized to death", and would "scramble for medals".[10] Grants would be "reduced to starving point"[11], and two witnesses said their Committees would never have started Schools under the new regulations.[12] Committees had "too little to do because of vexatious interference", or "had no time to observe the various regulations", and were never consulted when regulations were changed.[13]

Cole's defence was that the system was experimental, that since 1857 the Art Directory had had on its title page "rules subject to revision", and that students invariably "chose the most laborious example" when options were

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1 D.S.A. 13th Report 23-27
2 D.S.A. 14th Report 12
3 S.C.S.I. AA. 166-167
4 Ibid. A. 169 (Cole)
5 Art J. June 1863
6 Ibid. November 1863
7 Ibid. January 1864
8 Ibid. April 1864 and Cole MS Diary 22 July 1864
9 S.C.S.A A.2627 (C.H.Wilson) A.2272 (Potter) A.1450 (Sparkes) A.2493 (Keith)
10 Ibid. A. 2149 (Bacon)
11 Ibid. A. 3723 (Akroyd)
12 Ibid. A. 2464 (Murray) and A. 701 (Gregory)
13 Ibid. A. 2157 (Bacon) A.2446 (Murray) A.2361 (Potter) A.2607 (Wilson)

allowed.[1] He refuted the charge that examples, which had of course to be common to all schools if examinations were to be standardised, were "few, bad, and out of date".[2] Students were free to practise from any examples, he said, and Schools were free to try what they wished, if they were prepared to pay the full price.[3]

v) The consequences of payment on results

As has been recorded,[4] the Department refused to revert to the "old system", despite the recommendations of the Committee, and the Schools survived by using the local resources, with the exception of rate aid, which was the Department's intention. In raising fees and developing local subscriptions, Sheffield[5] and Birmingham[6] typified this action, and turned debit balances into credits. Even an insinuation that the Department had raised standards without warning seems to have gained little support in 1872.[7] Few witnesses before the Technical Instruction Commission mentioned the system of payments on results: Sparkes was sure that the system which had previously prevailed was best, but he produced no evidence in support of his contention. He quoted Northcote as having said "payments on results, as long as the results are not too good".[8] A pottery manufacturer claimed that all too often the main object of the teachers was "merely prizes and grants"[9], but these were the only objectors.

There were, however, marked irregularities in examinations: the prediction of some teachers before the 1864 Committee that temptations would be great were fulfilled. There were cases of "Working by Art Master on drawings"[10], "Personation"[11], and tracing of designs made by another person, for which a Gold Medallist was deprived of his award.[12] In general, however, it was not until the last years of the Department's existence that criticism became so concerted, and its own administrative burden became so heavy, that radical changes were made in its system.

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1 S.C.S.A. AA. 254, 4367 and 505
2 Ibid. A. 1236
3 Chapter III Section (c)(iii)
4 S.C.S.A. AA. 433 and 472
5 Art J. January 1867 and April 1870
6 Cole MS Diary 31 April 1868 and Art J. April 1871 and March 1872
7 Engr. 21 November 1872
8 R.C.T.I. AA. 1184, 1188 and 1191
9 Ibid. A. 974 (G.Wedgwood)
10 P.M. (1877) IV 44
11 Ibid. (1873) K 2. sec. 23
12 D.S.A. 26th Report 544

vi) The Manchester School of Art

The relations of the Department with the provincial Schools at this period are epitomised in the development of the Manchester School of Art. From its inception, the School had "aimed at higher Art" and its Committee believed that the production of designs there would have no useful influence on local manufactures.[1] In 1849 it was the "least successful" of the provincial Schools, in the opinion of Milner Gibson's Committee.[2] It was "transformed" by a new Headmaster, J.C. Hammersley, and "bid fair to become a School of Utility".[3] It was always plagued by debt. The annual expenditure exceeded receipts by £500 in 1851,[4] after Cobden, a member of its Committee, had unsuccessfully proposed an attempt to obtain rate aid.[5] Cole's Journal doubted if it would ever succeed, and cannot have helped future relationships by poking fun at Hammersley for wishing to be known as "Principal", and describing his own designs as "dull, ugly and elaborated into a patchwork quilt".[6]

The Committee was one of the first to express concern at the Department's regulations, and wanted "a relationship more akin to that of schools with the Privy Council".[7] This initial distrust grew into bitterness when Cole visited the School and recorded "Report full of vagueness ... Committee wish to be independent ... patterns old-fashioned".[8] Despite this, the School won more prizes than any other in the first Annual Exhibition.[9] Opposition culminated in two deputations to the Board of Trade to demand more local control. Cole merely noted that the first had taken place in 1853[10], but the following year he noted that "Mr. Cardwell told them tendency of the system was to reduce assistance ... unwilling to be charged with elementary education".[11] "Truce for a year proposed by E. Potter", Cole recorded when he visited the School again, after noting "Dispute on principles".[12] Opposition did not, however, die. Manchester had "proposed a Congress ... to demand fuller justice for the provinces", as "the Local Committee ... are not prepared to be reduced to the

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1 S.C.S.A. AA. 2241 and 2243 (E.Potter, M.P., and a member of its Committee)
2 J. of D. October 1849
3 Ibid. March 1850
4 Ibid. July 1851
5 Ibid. February 1851
6 Ibid. August 1851
7 D.S.A. 1st Report xli
8 Cole MS Diary 28 January 1853
9 Ath. 7 May 1853
10 Cole MS Diary 20 July 1853
11 Ibid. 4 May 1854
12 Ibid. 6 December 1854

rank of an Infant School;"[1] and had had to be told that it must arrange for instruction in "Schools for the poor"[2] before Cole's "truce", and Potter returned to the attack with a speech in which he suggested that all the provincial schools were "being reduced to inferior drawing schools",[3] after Manchester had had to be reminded about the "artisan condition".[4] Tempers became better, if only for a time. Potter was "tired of the School", he told Cole, "but would not leave it until it was out of debt".[5] His Committee, however, continued to resist. They were taken to task in 1858 for having only 206 "public class students" in comparison with Birmingham's 810 and Liverpool's 964, and were being equalled in successes by the much smaller Warrington School.[6] Debts were cleared off by raising fees in 1859.[7] Hammersley was the "only master in the country" who did not submit correct details in 1860. He was rebuked for raising the matter of "over complicated regulations" with his Committee, and not directly with the Department.[8] When told that Hammersley's guarantee would cease if he left Manchester, the Committee's reply was that the School must, therefore, "close due to the distress of the neighbourhood".[9] When Hammersley moved to Bristol (after what Potter claimed was years of "irritation"[10]) Muckley, later described by Cole as "a conceited prig",[11] took over. There was then yet another deputation for the continuation of the salary.[12] This was not granted: the Annual General Meeting of the School the following year recorded "the grave injustice of the withdrawal of the £300".[13]

While there was a threat that the School would close if "payments on results" were "insisted on"[14], Cole charged by implication that the School was the only one in the country which paid its master a fixed salary, when he said that a "School in a city ... where political economy is supposed to be broader and wider than anywhere else" had "fallen into this mistake".[15]

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1 Cole MS Diary 8 October 1854
2 MS.M 3.30 (21 November 1854)
3 Art J. February 1856
4 MS.M 5.10 (19 October 1855)
5 Cole MS Diary 10 August 1857
6 Engr. 26 March 1858
7 Art J. April 1859
8 MS.M 11.92
9 Ibid. 15.109 and 118
10 S.C.S.A. A.336
11 Cole MS Diary 28 February 1868
12 Ibid. 1 August 1862
13 Art J. May 1863
14 Ibid. June 1864
15 S.C.S.A. A.4396

A deputation to the Lord President with other Schools was planned when the Department pressed on with its plans.[1] In common with the other Schools, Manchester had to survive by adopting the very means which it had resisted. "Increased fees saved the School",[2] and later, after "the humiliation of a personal canvass",[3] greatly increased voluntary subscriptions were reported.[4] By the time the Royal Commission on Technical Instruction sat, in the early 1880's, a local calico printer could say that the initial objection of local manufacturers to "specific training in design" had"long since gone".[5] Thus, the most determined and independent of the local Committees had, like the others, come to terms.

vii) The last years of the Provincial Schools

The actual modifications in the system, designed in the main to place greater stress on the "design" functions of the Schools, are detailed elsewhere.[6] The great increase in the powers, and prosperity,of the "local authorities" which were set up under the Technical Instruction Act,[7] bore particularly heavily on the Schools of Art which had to rely only on the Departmental grant and whatever fees they could persuade their students to pay. The West London School of Art, for example, had been in financial difficulties for some time.[8] Its closure in 1891, together with that of the St. Martin's School of Art, led to a protest meeting which discussed "means of defence against the Polytechnics with unlimited funds".[9] "Sneers" by the Head of the Bristol School of Art at the "superficial teaching under the County Councils" were noted: the Magazine of Art, no friend of the Department, described these as unjust, and claimed that the majority of teachers preferred the aid given by the Councils to that so carefully controlled by the Department.[10]

The Art Schools also faced competition from the School Boards which entered their field without any firm legal justification. "Encroachment on the work done in Design and Life" by the London School Board's schools was reported in 1897.[11] This competition eventually led to an appeal to the local auditor

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1 Art J. May 1865
2 Ibid. January 1868
3 Ibid. April 1870
4 Ibid. February 1871
5 R.C.T.I. A. 2816 (T.W. Grafton)
6 (i) Section (e)(iii), Chapters IV section (d) and V section (c)(ii)
7 Chapter V Section (d)
8 P.M. A. 4711 (January 1889)
9 Nat. 8 October 1891
10 M. of A. 1897-1898 507
11 Ath. 14 August 1897.

by the aggrieved Camden School of Art, and to the celebrated Cockerton Judgement, as has been recorded.[1] Despite the gradual take-over of responsibilities by the local Councils, and modifications in the regulations which governed its aid, such aid continued to be given by the Department to the Schools on which its system had been founded. They continued to flourish. By the end of the century, over 120,000 students in one year were receiving instruction which qualified for aid.[2] Once again, a system founded in the Department's earliest days had continued, with relatively minor modifications, to produce successful results to the end of its career.

c) The elementary schools

i) The initial schemes

Cole's first plan was for "Schools of Elementary Drawing", as "feeders" for the Schools of Art, but they never developed, and this "elementary" function was allocated to the schools of the Education Department, which, by teaching drawing to as many children as possible, would prepare a sound foundation for the later instruction of specialists, and would "disseminate taste" throughout the rest of the population. Thus, the elementary schools were to share the emphasis on drawing as a basis of instruction. One of the conditions which had to be fulfilled before a provincial School of Art received Departmental aid was a "link" with at least three "parish schools" in its area.[3] The schools would pay 5/- a year for each child, or £5 for all the children, in return for "a weekly lesson of one hour to the whole school". (Private schools would be assisted if they paid £10 a year.) The Schools were instructed to make the first approaches, and not to wait for the "parish" authorities to become interested. Such "elementary" lessons were to be given before 11.00 a.m., the School time-table being adjusted accordingly.[4]

Doubts were expressed in some quarters on the ultimate benefits of the scheme, especially in view of the shortness of the average period of school attendance.[5] "The keys of instruction could be pitched low if they were too high", Cole argued, and he believed four years of age was not too early to begin teaching drawing. Children of that age could "use the slate".[6] A

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1 Chapter V Section (e)(iii)
2 Table XVIII
3 D.P.A. 1st Report 9
4 D.S.A. 1st Report xxiv and 131
5 Burchett put it at an average of two years (D.S.A. 2nd Report 71), and another calculation put the maximum time available in a child's school life as eighty hours in all (D.S.A. 1st Report 59)
6 D.S.A. 1st Report 154

precis of replies from practising teachers revealed that the Department looked with favour on those who preferred imitation by the children of the teacher's blackboard demonstration, following him line by line, (One teacher said that he found it "difficult to teach more than eighty children, even with monitors correcting".[1]) "Dry routine" was, however, seen as "so much lost time", and examples which could be copied were requested from the public.[2] (Punch made much play with this suggestion. It was "happy to comply with Mr. COLE's request", and "would furnish the Department with any quantity of material", quoting "a dirty faced little fellow who had in all received twentythree minutes of tuition" who was able to "convert a round object" (a simple circle) into an animal "by suggesting legs".[3])

One means of encouragement of drawing in the schools was by the presentation of small prizes of pencils, rubbers, and sets of drawing instruments.[4] (One of Cole's own earlier successes had been a cheaply produced "colour box", sold through the Society of Arts,which reached a total of eleven million sales by 1870[5]). The original cost of the instruments was elevenpence a set, but this proved too cheap, and approval was given to purchase sets at a cost of three shillings.[6] Prizes were eventually offered to all elementary schools, and not just those in connection with the Department.[7] An inducement of cash payments to teachers. began on a small scale with an "experiment" in three towns in 1856, and this was the first example of payment on results, antedating the full scale adoption of the scheme by seven years.[8] This was regularised in 1857 by a system of fixed payments, on the results of examinations in a "standard drawing exercise", of 2/- or 3/- per child.[9] As a result, an increasing number of elementary school teachers taught their own children, thus helping to reduce one cause of complaint by the Art Masters. ("A good teacher of drawing who could not draw himself" was seen by Cole in Birmingham.[10])

There was an initial plan to send peripatetic teachers to areas where Schools of Art did not exist,[11] but this did not develop.[12] Where Schools

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1 D.S.A. 1st Report 62-66
2 Ibid. 54
3 Pch. January 1853 15
4 D.P.A. 1st Report 118
5 Wood History of the Royal Society of Arts (London Murray 1913) 214
6 MS.M 4.128 (15 October 1855)
7 Ibid. 5.202-204 and 212 (June 1856)
8 D.S.A. 4th Report 52
9 D.S.A. 5th Report 43
10 Cole MS Diary 29 January 1856
11 D.S.A. 1st Report xxiv
12 Engr. 24 December 1858

were created, local teachers were encouraged to attend their classes.[1] The Department claimed early success for the scheme, saying that "increasing numbers of children are leaving the parish schools to enter the Schools of Art to carry on with their training".[2] There were difficulties with the Education Department during the development of the scheme, as have been recorded.[3] The Newcastle Commission noted that an average of 11% of children in grant earning schools were "receiving instruction in drawing", and that the "agricultural" regions were those where it was least favoured.[4]

ii) Changes with experience

"To neglect instruction until the adult comes along ... would be a costly operation", Cole told the 1864 Committee. He admitted,however,that there had been a general relaxation of the rule that the elementary schools must pay £5 towards the costs of instruction.[5] Witnesses before that Committee greatly doubted, however, if the Elementary Schools were acting as "feeders" for the provincial Schools, especially in view of the limited time available for instruction. Ten of 38 Schools reported that they had received no students at all from that source, and their spokesman,Sparkes,calculated that he had received, at the most, six such students in several years.[6] There was general resentment from the masters at the "elementary teaching condition", and the abolition of this regulation,[7] because of an improvement in the supply of primary teachers who could instruct in the subject,[8] was one of the few successful consequences of the 1864 Committee's deliberations. The Department still wished such connections to be encouraged, however.

A more disturbing feature for the Department was one consequence of the introduction of the Education Department's Revised Code in 1862, which abolished "payments to teachers of the labouring classes on drawing certificates".[9] A concentration on grant-earning subjects meant that schools could not spare time for drawing.[10] The numbers of children receiving instruction fell in 1862, and

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1 D.S.A. 4th Report xxix
2 D.S.A. 3rd Report 34
3 Chapter II Section (e)
4 Report of the Royal Commission on Popular Education in England [P.P. (1861) XXI] (114)
5 S.C.S.A. AA 105, 540 and 4314
6 Ibid. AA. 764-769 (Gregory) A. 960 (Sparkes)
7 P.P. (1865) XLIII 1-5
8 S.C.S.A. A.251 (Redgrave)
9 MS.M 15.92
10 S.C.S.A. A.2508 (Keith) A.1517 (Brewtnall)

more alarmingly perhaps, the numbers of teachers and pupil teachers attending Schools of Art fell,too.[1] The Department's reaction was to increase financial incentives, at the same time that its sister Department was endeavouring to encourage concentration on the basic subjects, by increasing payments on "successful exercises".[2] (There seems to have been little change in the prizes despite a complaint that "children must get tired of three pencils and a rubber".[3]) The result was a general rise in the numbers of children receiving instruction.[4] "Mere grind", and lack of real instruction revealed by "spoiled papers"[5] was discouraged by a regulation that no payments at all would be made unless 10% of the children entered were successful,[6] and extended payments were made to "Unions of Poor Schools".[7] Cole was still concerned that "artistic talents should be discerned and developed in the young".[8]

iii) Growing criticisms

Poynter, then the Art Director, disclaimed any intention of turning children into artists, but he argued that it gave them a chance to develop their talents.[9] Even Samuelson seemed pleased that "many thousands of children are taught to draw by the Science and Art Department."[10] The officials of the Department must have been cheered by the regulation of the London School Board that all its teachers must hold the Drawing Certificate (for which an increase in pay was given)[11] and by the fact that the Birmingham Board made drawing a compulsory subject for boys in its schools.[12]

In a further attempt to reduce the entry of markedly unqualified children, payments were reduced by one penny on each "failure" in 1882.[13] Witnesses before the Technical Instruction Committee who referred to the teaching in the elementary schools, however, were almost unanimous in their condemnations. The results were "very poor indeed"[14], and "miserable"[15], it was alleged. "Children left school quite unprepared for further instruction

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1 S.C.S.A. A.246 (Redgrave A.1517 (Brewtnall) and D.S.A. 10th Report 53
2 D.S.A. 10th Report 53
3 Engr. 26 August 1859
4 S.C.S.A. AA 246 and 251 (Redgrave)
5 Ibid. A. 4150 (Bowler) A. 253 (Redgrave)
6 D.S.A. 10th Report 2
7 D.S.A. 11th Report 10
8 Cole MS Diary 6 April 1869
9 N.A.P.S.S. 1875 Report 63
10 F.R. xxv (July - October 1881) 91-97
11 D.S.A. 22nd Report 386
12 D.S.A. 26th Report 315
13 D.S.A. 29th Report 1
14 R.C.T.I. A. 3630 (Oakley)
15 Ibid. A. 473 (Baines)

at the Art Schools",[1] although Sparkes, who had argued this point strongly in 1864, now conceded that many of his students had "gained a knowledge of drawing in the National Schools".[2] Only one witness believed that the drawing instruction provided "a good preparation for a trade".[3]

The Committee was firmly of the opinion that the "inadequate instruction" was of "little value". It pointed out that three quarters of the schools did no drawing at all, and referred to the "absence of competent teachers, models and methods". It believed that "inspection by Whitehall Inspectors would be better than a mass of inferior drawings sent to Kensington."[4] (An H.M.I. had made this point strongly,[5] and the method had been favoured by Donnelly, who had at that time no official responsibility for the subject.[6]) Despite these recommendations, Elementary School drawing remained under the Department for most of the rest of its existence.

While Armstrong, Poynter's successor, predicted progressively better results from the development of Elementary School drawing[7], criticism continued to mount. "Drilling hosts of boys who do not intend to make drawing their profession"[8], "little free about free-hand", and "slavish copying"[9] and "indiscriminate copying"[10], were typical comments. "Examination day" in a London Board School was "a humiliating experience ... with only 2% of the pupils showing any accuracy or freedom of development", in the opinion of one teacher;[11] while another writer believed that the system was "vicious".[12] A child of seven could earn payments, and most children who followed the subject at all began at that age.[13] The proportion of scholars who did in fact receive instruction remained low.[14] Insistence upon drawing as a feature in the training of teachers would be the only way in which improvements could be effected, it was argued[15], and attempts to influence such training are later detailed.[16]

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1 R.C.T.I. A. 1073 (Arnoux)
2 Ibid. A. 1112
3 Ibid. A.2175 (Paul)
4 Ibid. A. 519
5 Ibid. AA. 3697-3699 (Fitch)
6 Cole MS Diary 22 February and 15 March 1878
7 D.S.A. 33rd Report 77
8 Lord Norton (C.B. Adderley) N.C. February 1883
9 N.A.P.S.S. 1884 Report 675-677 (J.P.Seddon)
10 Ibid. 701 (E.R.Taylor)
11 M. of A. 1885 218 (Jas. Runciman)
12 M. of A. 1885 326 (H.V. Barnett)
13 R.C.T.I. A. 3169 (Armstrong)
14 Table XIX
15 R.C.T.I. AA. 3158-3332 (Armstrong) and D.S.A.37th Report xxiii
16 Chapter XI Section (C)(a)

iv) Later developments

For a very brief period, drawing became the responsibility of the Education Department, as the Technical Instruction Commission had recommended. By the Education Department Code of 1885, Drawing could qualify for grant from that Department, and the Department announced that its support would be withdrawn from March 1886.[1] However, since the Education Department grant was subject to the limitations on total grant, even the few schools who taught the subject began to give it up.[2] The subject was returned to the Department's care in 1889[3], and the grant for its encouragement was removed from the Code.[4] The Cross Commission of 1888 recommended that it should be made a compulsory subject for older boys.[5] This was, in fact, carried out by the Code of 1890,[6] although the Department continued to administer the grant.[7] A rapid increase in the number of children studying the subject followed.[8] The development of "object" drawing to replace much of the previous "copying"[9], and the extension of scale drawing,[10] together with improved methods which were promoted among teachers by the "Drawing Society"[11], led to general progress in the teaching of the subject. While District Inspectors were appointed, however, payments were still made on "drawings sent to Kensington".[12]

Modelling in clay as an elementary school subject was strongly favoured by Sparkes,[13] by a professional modeller,[14] and by an art critic,[15] but its adoption was not marked. It "did not develop the observation to the same extent as drawing", believed Bowler.[16] It underwent extensive development in Schools of Art from 1884[17], but it never received a Departmental grant, at elementary school level, possibly because it was "very expensive and difficult to carry out".[18] There was, however, more success with "Manual Instruction". It was seen as supplying "mental training, and a corrective to the priggishness of the

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1 D.S.A. 33rd Report xiv and 82
2 D.S.A. 33rd Report 82, Art J. 1886 355, R.C.E.E. 147
3 D.S.A. 35th Report 18
4 Hd. CCCXXXVI (1884) 1700
5 P.P. (1888) 217 (123)
6 Code of 1890 Article 15 [P.P. (1890) LV (423)]
7 D.S.A. 38th Report xxv
8 Table XIX
9 R.C.T.I. AA. 3423, 3424 (Armstrong and Bowler)
10 Ibid. A. 3336 (Armstrong) and D.S.A. 36th Report xix
11 J. of E. December 1 1885 and N.A.A.A. 1890 Report 149-156 (T.R.Ablett)
12 Chapter X Section (c)(v)
13 R.C.T.I. AA. 1114 and 2091
14 Ibid. A. 2355 (Wright)
15 Art J. 1885 137 (Leland)
16 R.C.T.I. AA. 3252-3254
17 D.S.A. 31st Report 3
18 Hd. XLII (1896) 1425 (Gorst)

class-room",[1] and recommended for adoption by the Technical Instruction Commission.[2] The Cross Commission also recommended its introduction.[3] "A graduated course in ordinary tools used in wood and iron" could qualify for payments after 1890, so long as it was connected with drawing, and "taught out of school hours",[4] a regulation which was met if "Code" subjects received at least twenty hours a week.[5] A syllabus was "one of suggestions, not regulations", and the teacher could be "a skilled artisan".[6] This introduction was welcomed by Nature, which hoped, however, that there would be "efficient instruction to guard the public purse from being depleted to enable small children to construct bad soap boxes".[7] A general increase in its teaching followed.[8]

In view of the great controversy over the regulation which enforced "teaching in connection with local parish schools" in the early days of the scheme, it is interesting to note that when this was no longer a condition of grant, the Birmingham School of Art "supplied masters to all the elementary schools in the city" in 1892.[9] Herkomer, a R.A. and former student of the Central School, believed in 1894 that it was time to "mend or end" the system, and talked of "unwieldy machinery and all the bad effects of impersonality".[10] In the following year, the Department introduced an Alternative Syllabus for Drawing. This allowed more "spontaneous activity" and stressed the "development of the association of ideas", but children in the higher standards still went on to "geometrical construction as a foundation for design".[11]

Whether the elementary schools ever played their full part in the overall scheme is conjectural: until the 1890 Code was issued, there was never more than a small proportion of children who were taught the subject under the Department.[12] The Committee on the Distribution of Grants recommended, inter alia, that the Education Department should take over full responsibility for the subject.[13] This was done in 1898, the Department retaining an interest

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1 Engg. 25 October 1886
2 R.C.T.I. 524 and 428
3 P.P. (1888) XXXV 217 (117)
4 D.S.A. 38th Report xxv
5 Code of 1890 Clause 101e
6 D.S.A. 38th Report 1
7 Nat. 3 April 1890
8 Table XX
9 Art J. 1892 344
10 J. of E. 1 November 1894
11 P.P. (1895) LXXVIII (907)
12 Table XIX
13 P.P. (1898) XXII (439) 5-32

only in the "Reform and Industrial Schools", which were fully taken over by the Home Office in 1899.[1] Thus, in the very final years of its existence, another "basic" element of the system disappeared.

d) The place of "Design"

i) Initial premises

The old Schools of Design had been attacked by Cole for their failure to produce designers, and he further believed that it was also their business to turn out designs. A survey carried out in his first year of office revealed that there was still a "yearning for Fine Art" on the part of many of the students, a general indifference from the public, and a general lack of interest or confidence from manufacturers.[2] In this sphere, the Department seems to have been content to suggest rather than to enforce. Thus, the ultimate stage in the School courses was "technical instruction", but it was not made compulsory for students to proceed to this stage. Nor was the possession of a "Stage VI" certificate insisted upon for the masters, although some "technical" work formed part of the course of training.[3] Initially, the form of appointment said that a master "must make himself acquainted with the staple manufactures of the place, and must send up once a year an ornamental design applicable to some class of manufactures"[4], but this regulation seems to have been allowed to fall into abeyance. Schools were asked to report on design developments in their areas,[5] but this was never a major feature.

ii) Early developments

There was a section for "applied design" in the Annual Exhibitions, but early results were disappointing. The Engineer claimed by 1857 that the Department had "abandoned the idea of instructing students in technicalities", and welcomed this, because it saw education as "preparation for life, not merely work".[6] The Department took every chance to publicise the employment of students as designers.[7] When "a remonstrance" was made by C.H.Wilson, former Head of the Central School, and now Head of the Glasgow School, against suggestions of ways in which "technical instruction" could be developed, it was noted that he "had always been averse" to this, but that its views would not be enforced.[8] Before the 1864 Committee, Wilson argued for the concentration

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1 D.S.A. 46th Report xxiv and 60
2 D.P.A. 1st Report 22-27
3 D.S.A. 3rd Report xi
4 D.P.A. 1st Report 87
5 D.S.A. 1st Report 162
6 Engr. 28 August 1857
7 D.S.A. 2nd Report xlix, 3rd Report lii, etc.
8 D.P.A. 1st Report 28

of efforts in a limited number of manufacturing centres.[1] If the development of national taste were an object, argued Cole in reply, a cathedral town would be the very best place for a School, since the numbers of wealthy and influential consumers would be relatively higher there.[2]

Before that Committee, Cole argued that courses in all localities could be "95% basic",and that "we teach design without applying it". He claimed improved standards of manufacture, said that the importation of foreign designs and the immigration of designers had ceased, and claimed even that British designs were now being "pilfered" abroad.[3] Objections were made that foreign designs, and designers, were still in great demand,[4] and that classes in design were "sparsely attended".[5] The prejudice against designers trained in the Schools exhibited by other workers not so trained was instanced,[6] as were the fears of manufacturers that in supporting classes they would be training workers for their rivals or helping to reveal trade secrets.[7] Designs produced were "impracticable because they showed a want of mechanical knowledge", believed a Sheffield manufacturer, and he added that in any case it was sufficient for "ordinary workmen" to be "able to follow instructions since they cannot apply taste".[8] On the other hand, four witnesses believed that Schools had been successful in producing designers,[9] and cases were quoted where manufacturers insisted that their apprentices attend Schools.[10] "A decided improvement in manufacturing design" was credited to the Department by Eastlake, the P.R.A., but he was also its Chief Examiner.[11] The Committee believed that there had been a general improvement in "taste", and that workmen and manufacturers valued the facilities offered.[12]

The Art Journal had pointed out with glee in 1857 that the Local Medal had in fact been designed by a Frenchman,[13] but even that journal was prepared to credit the Department with the responsibility for a general improvement in design by 1860.[14] The Engineer, another usually hostile periodical, agreed

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1 S.C.S.A. AA. 2597, 2617
2 Ibid. AA. 2563 and 2632
3 Ibid. A. 282, 293, 294, 514
4 Ibid. AA. 2251-2252 (Potter)
5 Ibid. A. 1068 (Sparkes)
6 Ibid. A. 1685 (Bacon)
7 Ibid. A. 2124 (Bacon) A. 2241 (Potter)
8 Ibid. AA. 3418-3419 (Parker)
9 Ibid. A. 2437 (Murray) AA.2516-2518 (Keith) A.2614 (Wilson) A.3706 (Akroyd)
10 Ibid. A. 1541 (Brewtnall) A. 3708 (Akroyd)
11 Ibid. AA. 3507 and 3639
12 Ibid. x
13 Art J. November 1857
14 Ibid. August 1860

on this point in 1866.[1] The Department quoted with pride the belief of the French Jurors at the 1862 Exhibition that the marked improvement in British designs since 1851 was due to its efforts,[2] and publicised queries from foreign nations about the workings of its system.[3] "You have organised a system of Schools for Europe",Cole was told by a foreign visitor in 1862.[4] The French developed a "Central Union of Fine Arts" in imitation of the Department's system,[5] and there were requests for advice and information from the U.S.A.[6] and from Japan.[7] The failure of "technical instruction schemes" at the Central School is detailed later.[8] The scheme for "National Design Scholars" there, as far as the "technical" training was concerned, was general rather than specific, although the Department never failed to publicise successes. The statement of the Examiners in 1867,that "the special manufactures of districts are well catered for",received particular emphasis.[9]

The Museum's special Exhibitions were admitted to have influenced design.[10] The revival in the use of terra cotta was entirely due to the Department's efforts. Engineering doubted if it would "ever be popular outside the magic circle of South Kensington",[11] but it came into general use as a decorative building material.

iii) Growing demands for direct "trade" instruction

As the system developed, there were increased demands for more direct teaching of "design", which paralleled the position in the science teaching, where industrialists and workmen increasingly doubted the value of the study of "abstract principles". While there could be favourable comments on the influence of the Department's work on the improvement of "taste", and on standards of design,[12] and while former students could attribute their successes in industry to their studies under the Department,[13] these demands grew.

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1 Engr. 3 August 1866
2 D.S.A. 10th Report 258-264
3 Ibid. xv and 11th Report xvii
4 Cole MS Diary 7 June 1862
5 Ath. 14 October 1865
6 Cole MS Diary 8 October 1870
7 Ibid. 20 June 1872
8 Chapter IX Section (a)(iii)
9 D.S.A. 14th Report 175
10 Ath. 25 July and 12 September 1863 and Hd. CLXXV (1865) 1174 (Layard)
11 Engg. 17 July 1868
12 N.A.P.S.S. 1878 Report 161 (Parry) 1879 Report 204 (Comyns Carr) 1880 Report 196 (W.B.Richmond)
13 Cole MS Diary 10 September 1877 (J.Dickinson) N.A.P.S.S. 1879 Report 208 (C.H. Morton)

Witnesses before the Technical Instruction Commission were divided in their opinions, and there is no clear line of difference between employers and workmen.[1] The Commission thought that industrial designing did not receive sufficient attention, because of "want of sufficient knowledge on the part of teachers and of sympathy on the part of the manufacturers". They saw in this "a great departure from the intention with which the old Schools of Design were founded",and stressed that "large grants of public money can hardly be justified on any other ground than its industrial utility".[2] The Department's officials must have felt that they were in an impossible position. On the one hand, they were charged with "the fatal heresy ... of saying that designers are not artists, and should not be trained in Art".[3] On the other, their teachers were accused of concentrating on "picture painters".[4] It would be fairer, and in the long run would have more influence, argued Sparkes, if prizes could be granted on works actually produced from designs[5], and Morris believed, as an Examiner, that many of the designs submitted would be impossible to translate into finished products.[6] (The intended medium was always taken into account when awarding prizes, claimed Bowler.[7])

Sparkes summed up the position as it was beginning to develop, of a "School of Art" and a "Technical School" developing side by side, with classes in the latter School being "subsidised" by the City and Guilds,[8] and this was to be the pattern for the rest of the century although, as will be noted, the Department successfully encouraged a more "practical" trend in its "own" classes.

iv) <u>The influence of "design" on manufactures</u>

In 1883 the reviewer of Cole's posthumous autobiography referred to a "recent debate in the French Parliament which revealed that the French are now importing Art objects from the United Kingdom",and he claimed that this was

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1 Those who believed that there had been good influences on design were - Mitchell, A Bradford woollen manufacturer (A.2629); Wright, a modeller (A.2342); Barnes, a glass-worker (A.3989); Willms, a glass designer (A.4147) and Rawle, a headmaster (A.783)
Those who doubted the value of "abstract studies" were - Arnoux, a designer (A.896); Sparkes (A.1154); Benn and Paul, cabinet makers (AA.2140 and 2145); Leake, a calico printer (AA. 2765 and 2798) and Shipton, a house decorator (A.3858)
Witnesses who felt that training in "principles" was vital were - Mott, a fabric printer (A.896); William Morris (A.1592), H.A.Bowler(A.3389)

2 <u>R.C.T.I.</u> 520
3 <u>Ibid.</u> A.480 (Curzon)
4 <u>Ibid.</u> A.1640 (William Morris)
5 <u>Ibid.</u> A. 1154
6 <u>Ibid.</u> A. 1166
7 <u>Ibid.</u> A. 3389
8 <u>Ibid.</u> AA. 1135 and 1139

"due to the influence of the Schools of Art on British manufactures".[1] It was stated in the same year that in Halifax,at least,"there is now no need for foreign designers".[2] These must,however,be seen against the growing criticisms of this period,[3] but,as will be detailed, there was an acceptance that a gradual improvement in design was being effected, due to the Department's influence, as its last years approached.

In one particular field there was little disagreement on the Department's success in influencing manufacturers and this was, by a strange co-incidence, an area in which the son of one of the "founding fathers" was intimately concerned. This was in the manufacture of lace, particularly in Ireland. A Normal Lace School had been founded in Dublin in 1851. It was taken over by the Department, but it gradually "became a School for general education, as lace-making was resented",and it never had more than thirty pupils.[4] Alan Cole had set about making himself an expert on lace. His father noted "an inspiriting article" on his work,[5] which was published in 1875.[6] In 1883, he visited Ireland, and lectured and circulated photographs and reproductions of laces from the Museum,which encouraged a revival of the industry, particularly in connection with religious houses.[7] A further visit in 1884 was followed by reports of improved sales from the Superiors of Irish convents: it was carefully stressed that "production and commissions are matters which must be regulated in the open market".[8] A "Lady Inspector" was then appointed: while there was "some timidity in accepting new designs",[9] sales of lace in the Cork district and in Waterford, it was noted,had doubled in two years.[10] When Cole's visits were discontinued at the end of 1887, there were demands for their resumption, because of "the increase in the lace sold due to the improved designs".[11] When Cole's "extra remuneration" was questioned, and it was averred that his "rightful place is at South Kensington", he was defended by three Irish members,who said that lace was now being exported to the U.S.A.[12] A

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1 Nat. 5 February 1883 (Rev. Newson Price)
2 N.A.P.S.S. 1883 Report 651 (W.H. Stopford)
3 Section (e)
4 D.S.A. 4th Report 157-158
5 Cole MS Diary 12 June 1875
6 Saturday Review 11 June 1875
7 D.S.A. 31st Report xxxv
8 D.S.A. 33rd Report xxiv
9 D.S.A. 35th Report xlv
10 S. and A. April 1889
11 D.S.A. 36th Report xli
12 Hd. CCCXIX (1887) 1544-1540

campaign was carried on for a resumption of the visits,[1] and Treasury approval for this was obtained. There were 43 Art Classes at Irish Convents in 1893, the Department reported.[2]

Cole published a series of articles which reveal his increasing mastery of his subject.[3] He had less success with the Honiton lace industry, which had suffered with the decline of the "Dame Schools" in which it had been taught, after the passing of the 1870 Act.[4] While praise for the revival of the Irish lace industry could be given exclusively to the Irish Industrial Association,[5] there seems little doubt that this was one field, however restricted, in which the Department's influence on design, and through this, on production, had been successful.

e) Reactions to the system

i) Ruskin's opposition

The foremost art critic of his day, John Ruskin, was also the foremost opponent of the Department's efforts in Art. One of his early speeches to students had been sufficiently in accord with policy to be reprinted in its Addresses.[6] He gave the inaugural lecture at the Museum in 1856[7], and told Cole when he met him in that year that "we were Popes of Doctrine".[8] Later that year, however, a paper he gave at Liverpool "was full of deprecation of our activities"[9], and by 1859 he was "rich in casuistry".[10] His own drawing scheme does not appear to have differed greatly from Redgrave's system, in their common basis in "Nature", but it has been contrasted favourably with "the geometrical analysis of South Kensington".[11]

Ruskin seems to have been at issue with the Department on two points. He believed that its standards of taste were suspect. In talking of "a brutal head ... over the door of a middle class girls' school" in London, he said, "There you may see the complete issue of Sir Henry Cole's Professorship at Kensington".[12] He would also appear to have thought that the Department was

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1 Hd. CCCXXX (1888) 1376, CCCXXXII (1889) 870, CCCXXXIII (1889) 1389, CCCXXXV (1889) 1090 (Justin McCarthy)
2 D.S.A. 40th Report lvi
3 M. of A. 1887-1888 202, 1890-1891 202-205, 1894-1895 419
4 Ibid. 1891-1892 30-33
5 Q.R. CLXXXIII (January - April 1896) 29-32
6 Address of 2 April 1857
7 Ruskin The Two Paths (London Smith Elder 1858) 1-21
8 Cole MS Diary 7 May 1856
9 MS letter Redgrave to Cole 15 October 1858
10 MS letter Redgrave to Cole 26 August 1859
11 Quentin Bell Ruskin (Edinburgh and London Oliver and Boyd 1963) 48
12 Ruskin Fors Clavigera (Orpington and London Allen 1896) IV 143 (Letter LXXIX)

helping to make Art a "lucrative occupation". In 1871, while he could refer to the "practical result of the energies of Mr. Cole at Kensington", he also talked of "the profits of Art employment".[1] Six years later, he charged that "the Professorship of Sir Henry Cole at Kensington has corrupted the system of Art teaching all over England into a state of abortion and falsehood from which it will take twenty years to recover".[2] He hoped that "the system of drawing" arranged for his "Company of St. George Schools" would "in many respects supersede that of Kensington".[3] The attacks caused Cole "much fun". He devoted a speech at Portsmouth School of Art to a consideration of Ruskin's attack on Whistler[4] in the celebrated libel action of 1878.[5] The attacks seem largely to have been ignored by Cole and Redgrave, who by the time of the most virulent assault were in no position to amend the course of training, except by suggestion, even had they wished to do so.

ii) Major criticisms

In the early period, there was a relative silence which would suggest that there was a general acceptance of the system by the country at large. The responses of teachers and Local Committee members, who were more closely involved, to what they regarded as the imposition of payments on results, have been recorded. In the last two decades of the century, however, general criticism became more vocal. Criticism of the system in the Schools centred on four main charges, the lack of connection with "trade applications", the emphasis on "High Art" (which resulted in the production, not of designers, but of artists) the "drill and routine" imposed by the examinations system, and the tendency to concentrate on grant earning rather than on "real education".

"Training should be more allied to the workshop" it was demanded,[6] as there was "little relationship between teaching and local needs".[7] Art Schools were "practically useless for technical purposes, since they teach in theory and not in reality", it was believed.[8]

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1 Ruskin Fors Clavigera (Orpington and London Allen 1896) I 10 (Letter I)
2 Ibid IV 134 (Letter LXXIX)
3 Ibid III 159 (Letter LVII)
4 The usually mild Redgrave "would burn the lot" if he were "given the Nocturnes and Symphonies as a free gift". (MS letter Redgrave to Cole 1 May 1877). Cole sat to Whistler for a full-length portrait. (Cole MS Diary 15 December 1878). One attraction must have been Whistler's avowed enmity for his brother-in-law Haden. (Gaunt The Aesthetic Adventure 122) who had become an opponent of the Department and a patron of J.C.Robinson.
5 Cole MS Diary 28 November 1878
6 Art J. 1884 309 (A. Harris)
7 Ibid. 1884 365 (Leading article)
8 N.A.P.S.S. 1883 Report 633-638 (R.W. Edis)

The criticism that the Schools of Art were producing, not designers, but second-rate artists, which caused "a loss of competent artisans without a corresponding replacement by artists",[1] was a recurrent theme at meetings of the short-lived National Association for the Advancement of Art and its Application to Industry, which was founded in 1888. The "government schools" had "usurped the function of academies of fine art"[2], it was alleged. "A mass of mediocre artists" was "being raised up" and, as a result, the entries to the Summer Exhibition of the Academy had doubled in ten years.[3] "Thousands of girls never proceed beyond flower painting", believed a woman critic.[4] There is in existence[5] a copy of an article which summed up these views[6], which was annotated, in pencil, by Donnelly. To the critics' demand for "classes in technical processes", Donnelly noted "they failed". To the suggestion that ornamental drawing was kept in the background, his comment was "bosh". To the charge that the Department received Whisky Money, which it misused, he wrote "Not a penny! " One further comment, "garbled", sums up the old soldier's general reaction.

"Drill and routine" were attacked,[7] and it was alleged that "Schools are conducted merely for grant purposes."[8] There was "a tendency to force work into particular grooves", Manchester teachers believed, in arguing for capitation grants.[9] The system "forced a concentration on grant earning at the expense of versatility", argued a former "private" student.[10] The scheme was too complex to allow diversions, it was charged, so that "much talent" was "left untapped".[11] The "huge numbers of works involved" meant that there could be only "perfunctory examination" of the works sent up[12], and the "rigorous uniformity needed to make an examination of thousands of drawings workable" left "no time to consider if they are good or bad."[13]

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1 N.A.P.S.S. 1883 Report 122 (Sir Rupert Kettle)
2 N.A.A.A. Report 1889 62 (J.E.Hodgson R.A.)
3 Ibid. 71 (J.C.Horsley R.A.)
4 Alice M. Gordon Women as Students of Design F.R. N.S. LV (January - June 1894) 521-527
5 Art Library, Victoria and Albert Museum
6 M.B.Huish Whence comes this great multitude of painters? N.C. 1892 XXXII 724-732.
7 Art J. 1884 309
8 N.A.P.S.S. 1883 Report 633-638 (Edis)
9 S. and A. January 1889
10 Emilia Dilke Art Teaching and Technical Schools (F.R. 1890 N.S. XLVII 231-241
11 N.A.A.A. 1890 Report 1-21 (R.B.Hodgson R.A. Presidential Address)
12 Art J. 1884 309
13 N.A.A.A. 1889 Report 51-62 (Hodgson)

iii) Defences and responses

Against these criticisms must be set statements made in the Department's defence. An improvement could be seen in manufactures "after one generation" of its work, and the "middle-classes showed a better attitude", thought one Art critic.[1] "Art Schools are lessening the dependence on foreign designers", believed Philip Magnus, although he described "the results so far" as "contemptible".[2] There had been "very great improvement", was the reply to a peer who queried whether there had been any advances in thirty years.[3] The system was "second to none", claimed Alma Tadema, one of the foremost painters of his age (and now one of the most forgotten). "The competitions show considerable progress, but like every successful thing, they are much attacked", he went on.[4] (He was an Examiner). The Department was doing good work, and "even rousing envy abroad", said a London School Board Report on Technical Education.[5] The charges made by Huish, previously recorded, were strongly refuted in Science and Art, which produced several examples of progress.[6]

The Department's defence was that "it always gave a practical direction to its teaching",[7] and the training of the teachers paid some attention to this aspect. It stressed the need for basic training in praising the Birmingham School of Art as "perhaps the best in the country ... where there is a wholesome tendency to direct the students to work connected with local trades without degrading the instruction to a low trade level".[8] As has been recorded, it did, however, make modifications to its system, which were designed to encourage more advanced study and a greater concentration on "industrial applications".[9] As a result, even the Art Journal, which had grudgingly admitted in 1886 that there were some improvements in the designs submitted in the National Competitions,[10] but had reverted to form in 1887, with a comment on the fact that "the wicked world of Art manufactures has paid as little heed to (the Department's) teaching as the profligate to the voice of the preacher",[11] noted improvements. There was a "new spirit in the National Competition" in 1895, and it welcomed the fact that the Examiners were "now

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1 N.A.P.S.S. 1884 Report 64 (Walter Besant)
2 N.A.A.A. 1889 Report 248-256
3 Hd. CCCXLVII (1890) 1335 (Cross)
4 M. of A. 1892-1893 8-10
5 Art J. 1893 128
6 S. and A. February 1892
7 Art J. 1887 221-224 (G. Redgrave)
8 D.S.A. 33rd Report 77
9 Chapter V Section (c)(ii)
10 Art J. 1886 341
11 Ibid. 1887 191

prepared to criticise ... it is no longer a case of "rest and be thankful".[1] The following year "more workmanlike and practical designs" had replaced the former "plague of birds and beasts",[2] and in 1899 it again praised the "practical nature of the work" which, it believed, was due to "the frequent demand for a practical direction in Examiners' Reports".[3] Thus, in the very final year of its career, the Department's most virulent and consistent critic in the ranks of the Press had accepted the fact that success was being achieved.

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1 Art J. 1895 287
2 Ibid. 1896 315
3 Ibid. 1899 281

CHAPTER NINE

THE SOUTH KENSINGTON ART COMPLEX

a) The Royal College of Art

i) General developments

ii) Staff

iii) The place of Design

b) The Female School of Art

i) Foundation and integration

ii) Continuation as a "private venture"

c) The Central Art Museum

i) Purpose

ii) The officials

iii) General administration

iv) Causes of opposition

v) Accommodation

d) District Museums

e) Relations with provincial Schools and Museums

i) Early attempts at encouragement

ii) The Department and the development of local Museums

iii) Provincial criticisms

iv) Increased aid

a) The Royal College of Art

i) General developments

The re-organisation of the old School of Design "with the training of teachers as its first concern", and its transfer from Somerset House to Marlborough House when it was taken over by the Department, have been recorded.[1] The system of divided responsibility, which had prevailed in the old School, was replaced by an organisation under one Headmaster, and "a more simple division of the duties of the Assistant Masters".[2] There were some links with the School of Mines in these early days ... "the Art students going there for instruction in Mechanical Drawing",[3] and lectures on "Science and its Art applications" were given at Somerset House.[4] A lecturer in Mechanical Drawing was appointed in 1853,[5] and the "Science lectures" seem to have fallen into abeyance during the period of bad relations between the chiefs of the Department and the School of Mines.

At Marlborough House, the School was "scattered ... and unconnected"[6] in "forty rooms".[7] The old Gower House at South Kensington was occupied in 1857,[8] but there was another move into "dilapidated houses" when the House was demolished to make way for permanent buildings.[9] "How we dine at South Kensington. Oh, Mr. Cole! "[10] was the caption to a Punch cartoon which showed a group of young ladies eating in extremely cramped conditions in 1863. Later that year the School moved into "new and permanent buildings"[11] which were praised especially "since males and females are properly provided for".[12]

This latter aspect had concerned Henley in 1852, when he was anxious that "proper steps should be taken to protect females from temptations".[13] The formation of "female classes" at Kensington from 1857[14] led to concern, and an Order of that year said that "the door-keeper of the Female School is ... not to leave unless an attendant takes his place".[15] The Matron of the Female

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1 Chapters I Section (d) and II Section (d)
2 D.P.A. 1st Report 17
3 Cole MS Diary 27 June 1853
4 MS letter de la Beche to Playfair 4 August 1852
5 Report on the R.C.A. (1911) Appendix
6 D.S.A. 4th Report 62-63
7 Cole Address of November 1852
8 D.S.A. 4th Report 62-63
9 D.S.A. 5th Report 48
10 Pch. 25 February 1863
11 D.S.A. 11th Report viii
12 Ath. 25 July 1863
13 Cole MS Diary 6 July 1852
14 Ibid. 19 January 1857
15 D.S.A.O.B. 9 November 1857

School was given the additional duty of "superintending young lady copyists ... in a separate room".[1] Permission to use a male model was not granted until 1868,[2] and Punch later saw this as "a useful occupation for an idle and ornamental young man."[3] Even a nude female model had to be approved by the "Female Superintendent".[4]

A department for students who would not be trained to teach, but who would pay fees which would assist in "self-support", was envisaged by Cole from the outset. "A scheme for a self-supporting School" was requested from Burchett, the Headmaster,[5] and regulations stated that high fees would be a feature of courses.[6] There was the usual distinction between "morning" and "evening" classes, with double fees for the former classes,[7] and the full-time Staff received a proportion of the fees,while the "masters in training" also taught in these classes.[8] The development of this "self-supporting venture" led to some division of purpose. Four men went on to the classes of the Royal Academy in 1862, and by 1864 this figure had risen to 13.[9] So popular did the School become,that it was necessary in 1871 to impose an entrance examination, which led to a reduction of numbers in the following session. The Department had to state that "the admission of the general public" would "not be allowed to interfere with the primary aim, the training of teachers".[10] An even more stringent admission test was imposed in 1882, and numbers again fell.[11] The School ceased to "train for the Royal Academy ... as wasteful", after a Report by Leighton, Poynter and Bowler in 1889.[12]

The School was officially designated "Royal College of Art" in 1897, and this was seen as "a high sounding and symptomatic title"[13] It was subjected to increasingly close scrutiny in the last years of the century, in common with the rest of the Department's activities. A scheme for its re-organisation was denied on two occasions in 1898,[14] but the fact that Armstrong's appointment as Art Director was extended to make re-organisation effective[15] would suggest that this was, in fact, the case. A further and more stringent

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1 MS.M 7.25
2 P.M. C 2 Mus. 130
3 Pch 6 June 1874 (Cartoon by du Maurier)
4 Cole MS Diary 26 January 1871
5 Ibid. 12 May 1853
6 D.S.A. 1st Report 1 and D.S.A. 2nd Report xxxiii
7 D.S.A. 3rd Report 37
8 D.S.A. 1st Report xlvii - xlviii
9 D.S.A. 9th Report 39 and 11th Report 60
10 R.C.T.I. 499 and D.S.A. 19th Report xiv,29-30
11 Brown op. cit. 19
12 R.C.A. Report (1911) 32
13 Art J. December 1898
14 Hd. LV (1898) 96 and LVI (1898) 64 15 S.C.M. 1898 Second Report A.399 (Donnelly)

admission test was imposed, with a further increase in fees, and numbers of private students fell in the first decade of the new century by nearly half.[1]

A number of "private" students eventually became acknowledged leaders of their profession, and even the Magazine of Art, not normally complimentary, could say "South Kensington ... whatever its defects ... has the credit of training some of the foremost artists of the day".[2] Linley Sambourne of Punch, Sir Joseph von Herkomer, Emilia Dilke, and Kate Greenaway were students at various times.[3] Private students, and the fees they paid, were a feature of the School throughout the period, although, as has been detailed, their admissions had from time to time to be regulated.[4]

ii) Staff

The only member of staff of the old School of Design who remained after 1855 was Richard Burchett, who became Headmaster of the "new" School, in succession to Redgrave, in 1852. Soon after Cole's appointment, Wornum was "restored after protests", and Herbert "awaited dismissal.[5] Redgrave and Cole were prepared to resign if Herbert continued,[6] and he left in 1852, to earn his living as a painter of religious pictures.[7] Wornum was removed from the School to become Art Librarian,[8] and also toured the country "lecturing in Schools of Design".[9] He caused trouble over Diaries,[10] refused to accept orders from Macleod[11], and "wrote an uppish letter" to Redgrave.[12] He left in December 1854 to become Keeper of the National Gallery, a post which he transformed from that of a sinecure to one of great importance.[13] He would, presumably, in that post resist most strongly any question of transfer to South Kensington. Redgrave, that gentlest of men, disliked his "brusque and bumptious manner",[14] and it was good for the peace of the Department that he went. The other members of the "old" staff, Bell, Richardson and Townsend, all of whom had worked with Cole in his "Summerly" ventures, had left by the end of 1853.

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1 R.C.A. Report (1911) 16 and 32 (From 390 in 1900 to 200 in 1910)
2 M. of A. 1879-80 III 262
3 D.N.B. and D.S.A. Reports
4 Table XXXIV
5 Art J. May 1852
6 Cole MS Diary 11 March 1852
7 D.N.B.
8 Cole MS Diary 9 August 1852
9 D.P.A. 1st Report 226-227
10 Cole MS Diary 28 June 1854
11 Ibid. 8 November 1853
12 MS letter Redgrave to Cole 25 August 1854
13 D.N.B.
14 MS letter Redgrave to Cole 21 August 1859

Beverell, the former Administrative Head, as has been noted,[1] died. Poynter, the Inspector, did not even transfer to the new Department.[2] The way was thus clear for Cole and Redgrave to pursue their "new" policies, through men of their own nomination.

The School had only three Heads during the whole of its existence under the Department, and the last of these served for only a year. Richard Burchett, the first Head, had been a student (and a "rebel" in 1845) and then from 1847 a staff member,[3] of the old School of Design. Cole could praise him publicly for "the care and minuteness" of his first Report,[4] but their official relationships were far from easy. Cole's experiments in "self-support" involved a "talk on salaries" with Burchett, which led to "an obnoxious letter", which the Headmaster later "withdrew".[5] The official announcement of the "new" salary scheme said that "the course, and discipline, would be improved by making emoluments partly depend on fees received".[6] Burchett gave a public lecture at the closing of Somerset House which Cole found "a curious mixture of sense, vulgarity and ignorance, but on the whole effective".[7] There was a brush over Cole's inspection of work in District Schools in 1854, when Burchett accused him of "espionage".[8]

Burchett "wanted to sit at the Board" in 1857.[9] He was told "that he had better resign" when the question of salaries came up again, and Cole was determined to be "supreme in management".[10] Redgrave acted as peace-maker,[11] and from that point, references to Burchett are on the grounds of dissatisfaction with his attention to his duties,rather than on his lack of co-operation in administration. Cole first rebuked him about absences in 1856,[12] and taxed him with unpunctuality in 1858.[13] The Board considered the matter in 1859, and the Head was told that if his health interfered with his duties, he must consider resignation. (This led to a "protest".[14]) Granville queried his "irregular attendance" in 1860.[15] A testimonial by Burchett to the value of a particular drawing pencil, used in advertisements, led to a rebuke, and an order to stop

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1 Chapter I Section (d)
2 Cole MS Diary 26 January 1852
3 D.P.A. 1st Report 210
4 Ibid. 17
5 Cole MS Diary 5 July and 13 September 1852
6 D.S.A. 1st Report xli
7 Cole MS Diary 23 December 1852
8 Ibid. 26 May 1854
9 Ibid. 28 February 1857
10 Ibid. 2, 4, and 6 March 1857
11 Ibid. 24 April 1857
12 Ibid. 8 October 1856
13 Ibid. 3 March 1858
14 MS.M 10.20 and Cole MS Diary 19 July 1859
15 MS letter Granville to Cole 13 August 1860

publication,in 1863.[1] The lack of co-operation shown by Burchett over attempts to put down "insubordination" among the women students in 1864 led to a further reprimand.[2] There was a proposal to reduce his fees in 1868,[3] and he was warned again on absences in 1871.[4] Renewed complaints of "Mr. Burchett's inattention to the School" were made in 1873, Cole's last year of office.[5]

Burchett died in 1875. To him was attributed "a principal share in the system" and he was praised as "the principal conductor of the vast scheme in Technical Education ... under the Art(sic) Department".[6] (This was later amended, on Redgrave's protest, to say that Burchett's principal influence had been on the provincial Art teachers he had trained.[7]) A memorial tablet was erected in the School by his pupils.[8] His own principal interests were in geometrical drawing, on which he produced text-books, and the development of the courses at the School must have owed much to this predilection.

J.C. Sparkes succeeded Burchett as Head of the School. (The Director for Art, Poynter, was officially its "Principal".[9]) As Sparkes had been the chief spokesman for the provincial Art teachers before the Select Committee of 1864, his appointment was proof, if proof were needed, of the end of Cole's influence with his own retirement. Sparkes retained his appointment as Superintendent of the Doulton "Art Potteries"[10], where he had carried into production his methods of clay modelling, and in which all the "artists" came from the Lambeth School of Art of which he had been Head.[11] Sparkes served as Head until 1898, becoming Principal in name and in fact when Poynter, who had suggested his appointment[12], was succeeded in 1881 by Armstrong as Art Director.[13] The brief tenure of the office by Walter Crane, who combined the duties with those of Art Director, has been recorded.[14]

A list of the staff of the School shows that, in general, members served for long periods, and the titles of their appointments reflect the

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1 MS.M 17.10
2 Ibid. 18.16 and P.M. T.116
3 Ibid. C 2 Mus. 169
4 Ibid. F 2 Mus. 96
5 The presence of this correspondence (Memorandum Cole to Bowler 22 April 1873, undated Minute by Bowler with details of previous complaints in 1859 and 1867) in the Department book which records dealings with the Treasury would suggest that on this occasion the Headmaster received a final warning. (Ed. 23.52 P.R.O.)
6 Ath. 5 June 1875
7 Ibid. 3 July 1875
8 D.N.B.
9 D.S.A. 23rd Report xi
10 Art J. 1876 61
11 Ibid. 1874 223
12 Ath. 25 December 1875
13 D.S.A. 29th Report xxiv
14 Chapter V Section (i)(iv)

concern of the School with the elements of Design,Drawing,and Ornament,rather than with "technical processes".[1] Since at one time so many of the teachers at the old School had been lame and deformed, and had found appointments to sinecures, implied Cole, there was eventually a regulation that such appointments could no longer be made.[2] When Cole asked Henley to approve the appointment of a disabled teacher in 1852, he received the reply that the man was being appointed to teach drawing, not dancing.[3] However, a candidate "who could not speak a word of English" was on one occasion sent by Wilson of the Treasury. He was not appointed.[4] Outside experts were employed on occasion.[5]

iii) The place of Design

Cole's plan for the national improvement of design was based on four precepts. These were, the "elevation of the National taste" by widespread instruction in Schools of Art and in the elementary schools, the training of teachers who would act as the agents for this, instruction in "technical processes" of teachers and designers, and the production of designs by the Schools. Classes in a variety of "technical" subjects were introduced with the re-organisation. (His Journal of Design had sarcastically welcomed the introduction of a potter's wheel,[6] there had also at one time been "a loom and kiln", but such "practical" subjects had been "submerged in the artistic curriculum"[7]) Porcelain painting, "metals", "furniture", jewellery work and wood engraving were soon under way.[8] "Advice on designs" by post was offered on payment of a fee of 2/-.[9]

A great opportunity to demonstrate the success of the policy came with the commission to design the "Car" for the funeral of the Duke of Wellington in late 1852. This was to be a "private transaction", decided the Board of Trade, and the supervisors, Cole and Redgrave, were limited to design, not execution.[10] Cole drove the makers, and his colleagues, hard[11], and became so "fatigued" himself that he was unable to attend the ceremony in the Abbey.[12] In fact,

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1 Report on R.C.A. (1911) Appendix
2 Cole op. cit. I 298
3 Cole MS Diary 3 November 1852
4 Ibid. 14 October 1853
5 A surgeon, Bellamy, acted as "Lecturer in Art Anatomy" (Ath. 12 September 1874)
6 J. of D. April 1849
7 Cole op. cit. I 298
8 D.P.A. 1st Report 20 and Cole Address of November 1852
9 D.P.A. 1st Report 28
10 Ibid. 29 and MS letter Cole to Granville 5 January 1853
11 Redgrave op. cit. 99
12 Cole MS Diary 17 and 18 October 1852.

students under the direction of the officials and of Semper, the "Professor of Ornamental Metalwork", built as well as designed: the "imperfect state of the execution" horrified Cole and Redgrave when they took over.[1] The Car was too big and too heavy for part of the route it had to cover,[2] and its additional ornaments were not of the Department's design.[3]

Semper, "the greatest German architect of his generation ... who firmly believed that tuition in the fine and decorative arts could not be separated",[4] toured the country under the Department's auspices "to advise manufacturers and workmen".[5] He was joined in this work by the "Professor of Style and Ornament", Octavius Hudson, who had "given up Spitalfields Schools for lack of money".[6] The two soon discovered that it was "difficult to impart design ideas to operatives". Semper left for Switzerland in 1855 "to join his father", and "Hudson's class has not gone well", Cole recorded on the same day.[7] Redgrave expected "a blaze" when he gave Hudson his notice.[8] "Much to be done to make the classes what we wish", Cole noted.[9] "Technical training" was "reorganised to become part of the teaching course", in 1856.[10] The last of the "technical classes", the female wood engraving class, was given up in 1859.[11] The failure of his scheme to train porcelain painters, in particular, was later referred to by Cole, when he said that they found no employment when they were trained. "You could not dictate to the country what it wanted", he admitted.[12] Even later, he said that "two or three experiments in trying to apply drawing, painting and modelling to specific industries failed".[13] Instead, the masters in training were encouraged to take the "Stage VI Certificate", which involved examination in "the principles of technical instruction". Relatively few ever did so. At least one journal welcomed the change of scheme. "Education is preparation for life, not merely work", said the Engineer.[14]

The production of designs in the School met with a similar lack of general success. Such activities were referred to in Annual Reports,[15] but Cole later

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1 MS letter Cole to Grey 5 January 1853
2 Cole MS Diary 21 October 1853
3 Cole later talked of "a papier mache helmet sham" which showed "a wilful ignorance of Art" (Address of November 1852)
4 N.Pevsner Academies of Art (Cambridge Universities Press 1940) 251
5 Ath. 25 September 1852
6 Cole MS Diary 18 August 1852
7 Ibid. 23 May 1855
8 MS letter Redgrave to Cole 4 July 1855
9 Cole MS Diary 9 July 1855
10 D.S.A. 3rd Report xi
11 D.S.A. 7th Report 18
12 S.C.S.I. A.305
13 R.C.S.I. AA. 204 and 312
14 Engr. 4 December 1857
15 D.S.A. 2nd Report xlix et seq.

claimed that this policy was suspended with his resignation.[1] Attention was therefore turned to a system whereby it was hoped to train designers, and not technicians. "National Scholarships for Advanced Students in Design" were set up in 1863, for students from the provincial Schools, who would attend the School and spend much of their time using the examples in the Museum.[2] Influence was thus "brought to bear on manufactures",[3] and a number of the students' designs were even sold to the French.[4] The annual number of Design Scholars remained at about thirty for the rest of the period and Annual Reports show that students took up eventual employment in a variety of trades.[5] A condition was imposed in 1882 that students "should return to the seats of manufactures[6] and candidates were limited to the "decorative trades" from 1887.[7]

The growing emphasis on design in the National Competitions,[8] to which reference has been made, meant that attention continued to be given to this aspect of study in the teacher training courses. "Great advantages are derived from the use of the workshops of the City and Guilds", Sparkes, the Headmaster, said in 1882.[9] Practical work in crafts was encouraged by Armstrong at the end of the period,[10] and Crane, in his brief period of office, added a Design department to the School,[11] but "his desire to appoint practical artists as professors was laid aside by the Department".[12] Real development only came in the new century with the formation of Schools of Architecture, Ornament and Design, Decoration and Painting, Sculpture and Modelling.[13] "It was still hard to convince manufacturers that the former South Kensington tradition is a thing of the past", in 1911.[14] There was "no organic connection between the Royal College of Art and the provinces except the supply of teachers, and scholarships", said Sparkes in 1897.[15] It was, however, through this connection that the Department really hoped to develop its policy in "Design", and the importance of the teacher training aspect of the School's activities, as distinct from the much less successful attempts to train designers and technicians there, cannot be over estimated.

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1 Cole op. cit. I 115
2 D.S.A. 10th Report 4
3 D.S.A. 13th Report ix
4 D.S.A. 15th Report X
5 At least one, Sir Luke Fildes, became a member of the Royal Academy (D.N.B.)
6 D.S.A. 29th Report 31
7 D.S.A. 34th Report 29
8 R.C.T.I. 399
9 Ibid. A. 1159
10 R.C.A. Report (1911) 32
11 Pevsner Academies of Art 290
12 R.C.A. Report 32
13 Ibid. 15-16
14 Ibid. 17
15 S.C.M. Second Report 1897 AA. 1483-1484

b) The Female School of Art

i) Foundation and integration

A Female School, in connection with the Central School of Design,was opened in 1842, in separate premises near Somerset House, and Drawing and Woodcarving were included in the subjects of study.[1] The students were "open to annoyances" and the premises were "a slum",[2] "overcrowded with dreadful ventilation... with a steam engine and a soap factory nearby".[3] There was an unsuccessful attempt to move to Bedford Square[4], but premises were eventually found in Gower Street, where the School remained for the rest of its existence.[5] The School was taken over by the Department of Practical Art in 1852, and arrangements were made for its students to pass on to "technical classes" at Somerset House[6] so long as they were "protected from...temptations".[7] The students did not "study the figure"[8], but there was an entrance examination which consisted of "copying the figures O, A, and S ... giving definitions in Practical Geometry ... and the names of geometrical forms".[9] Women were trained as painters or designers, and several of them became teachers.[10]

While Cole first raised the question of teachers' salaries being dependent on fees with Burchett, Mrs. M'Iain of the Female School was the first teacher to whom the new regulation was applied, and she objected strongly.[11] Cole must have been pleased with the general development of the School. His advice to his friend Thackeray to "send his girls to Gower Street"[12] would suggest that "middle class" students were encouraged as part of the scheme of "self support". Day and evening classes were operated: the high point of attendance came in 1855[13], but numbers had fallen to 116 by 1858.[14] "Wastage" due to marriage is not a problem new to our times; Cole's friend Chadwick prepared a Report on the School, and noted "once trained,many are lost ... by matrimonial engagements". His jocular suggestion that "even when plainer candidates were selected, they too obtained preference as wives to a perplexing extent",brought the criticism that his remarks were "in extremely bad taste".[15]

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1 Bartley op. cit. 145 and MS.M 10.117 (1 December 1859)
2 Art J. January 1849
3 J. of D. September 1851
4 Ibid. January 1852
5 Ibid. December 1851
6 D.S.A. 1st Report xliii
7 Cole MS Diary 6 July 1852
8 Ibid. 23 September 1852
9 Ath. 22 January 1853
10 D.S.A. 1st Report xliii
11 Cole MS Diary 29 May 1853
12 Ibid. 7 May 1854
13 D.S.A. 2nd Report xxxvi
14 D.S.A. 5th Report 52
15 Art J. August 1855

Mrs. M'Iain was pensioned and replaced by Miss Louisa Gann in 1857, as part of a "re-organisation to economise cost and not weaken efficiency".[1] The development of "female classes for teachers" at South Kensington, the fall in numbers at Gower Street, and the "rotten and dangerous condition" of the premises[2], caused Cole to decide to close the School. "Only talk so far" was Redgrave's description of Salisbury's "willingness to enlarge the premises".[3] When the Lord President visited the School, he was "mobbed", said that he had not heard the last of discomforts there, and "swore he would never go there again".[4] In April 1859 the Board accepted Cole's proposals.[5] The decision to close the School in July 1860 was announced[6], and the Headmistress was informed.[7]

ii) Continuation as a "private venture"

Miss Gann then proceeded to enlist support for the continuation of the School as an independent institution. She protested against the closure in the Art Journal.[8] When she approached the Queen, Cole was asked about the chances of success, since "it would be injurious if the Queen gave support" to an eventual failure.[9] Cole must have given such assurances,since the Queen became a patron and commissioned designs from the School.[10]

Miss Gann announced the support of Eastlake, the P.R.A.[11] The School had been "sacrificed to the absurd idea of self-support", said a defender.[12] By October 1860,half the fund to continue the School had been subscribed, and publicity was given to the fact that former students of the School had become the first women to be accepted by the Schools of the Royal Academy for over a century.[13] Cole himself was approached for a subscription to "one of your children ... which you have said must be self-supporting".[14] The new Art School at South Kensington was described as "The South Kensington Palace" and contrasted with "the Female School Barn".[15] There was the usual resort to bazaars and other efforts[16], and eventually £2,400 was raised.[17] A new School,

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1 MS.M 7.100
2 MS letter Redgrave to Cole 20 January 1859
3 MS letter Redgrave to Cole 16 November 1858
4 MS letter Redgrave to Cole 27 January 1859
5 Cole MS Diary 13 April 1859
6 D.S.A. 7th Report 20-21
7 Cole MS Diary 5 November 1859
8 Art J. February 1860
9 MS letters Phipps to Cole 30 January and 27 February 1860
10 Ath. 23 February 1861
11 Art J. April 1860
12 Ibid. July 1860
13 Ibid. October 1860
14 MS letter Professor Donaldson to Cole 26 March 1862
15 Art J. July 1863
16 Cole's "raree show" in 1864, at which the Queen was present, was in aid of the School. [Chapter IV Section (j)(iii)]
17 Art J. August 1865

with accommodation for 150 students, was opened in Gower Street in January 1866,[1] although further concerts and bazaars were needed to clear off debts.[2] Cole was asked to the first prize-giving.[3] By January 1869 the School was free from debt.[4] It continued to produce consistently the highest number of "locally qualified" women Art teachers for the rest of the century,[5] and could, of course, receive grants on results. Its development as a "private venture" shows the ways in which Cole could be firm in his pursuit of his policy, yet benevolent in his aid as a private person. He quoted "the success of the School when thrown on its own resources" as an argument for "greater local endeavour",[6] and he was correct in this assertion.

c) The Central Art Museum

i) Purpose

"A Commercial Museum" was planned for the South Kensington site by the Commissioners in their original plan[7], and in the Consort's 1851 Memorandum, an "Exhibition and Library" were featured.[8] Purchases from the Great Exhibition to form the nucleus of such a Museum were advocated.[9] A "National Gallery" and a "Commercial Museum" were among Disraeli's proposals in the 1852 debate on the loan towards the purchase of the land.[10] Several items from the Exhibition were purchased[11], and these were added to "the miscellaneous gatherings of the old School of Design"[12] to form a "Museum of Ornamental Art" at Marlborough House, arriving there in one "horse drawn waggon"[13] The Queen visited the Museum privately, and was accompanied by the Consort when she opened it officially on 17 May 1852.[14]

There were, of course, National Art Galleries already in existence, but the purpose of Cole and Redgrave was to use the Museum collections as an instrument of education in the widest sense, by the direct use by students of its exhibits as models, and by displaying these exhibits in such a way that members of the general public would be "instructed" and have their "taste"

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1 Art J. January 1866
2 Ibid. April 1867
3 MS letter Donaldson to Cole 10 December 1867
4 Art J. January 1869
5 Table XXXI
6 S.C.S.A. A. 4492
7 E.A. Bowring op. cit. 563
8 T. Martin op. cit. Appendix 569-573
9 J. of D. June and November 1851
10 Hd. CXXIII (1852) 217
11 J. of D. November 1851
12 J.C. Robinson Art Collections and Museums N.C. June 1880 979-985
13 R.C.T.I. A. 4336 (W. Smith)
14 MS. letter Grey to Cole 10 May 1852 and Cole MS Diary 17 May 1852

"elevated". The Museum would thus , it was hoped, eventually "raise the character of our manufactures, as well as the intellectual appreciation of those who have to produce and consume them".[1] They would, therefore, be "teachers of grown up men and women" and not, as were other collections, "sleepy and useless ... unless subservient to education".[2] The Museum thus differed from the Museum of Practical Geology, where "an educational institution had arisen out of a Museum, and not vice versa".[3] It also differed from the existing Art collections in that it was under the direction of a Minister of State, and was not controlled by trustees who were responsible only for an Annual Report to Parliament.

The position of the Museum in the overall scheme was outlined by J.C.Robinson, the Curator, in 1854. It was necessary, he argued, to ally all direct teaching with objective experience, and the collections were "organised to embrace a progressive series of manifestations" to this end. Thus, there would follow "deduction of abstract laws and principles". The inclusion of manufactured goods would enable artists and designers to study them at first hand.[4] (There was a "convenient apartment" for such study; objects could be removed from their cases, and teachers could take objects to classrooms in the Central School of Art.[5])

There was a short-lived "portion illustrative of false principles",[6] which was displayed next to "specimens of the best current production".[7] This section would be "very useful", thought the Consort.[8] It should have been of value in helping the public "to detect and avoid spurious affectations",[9] but they dubbed it "the Chamber of Horrors".[10] Some of the "false" examples proved more popular than the "good ones".[11] Dickens' Mr. Crumpet visited "The Department of Practical Art"(sic) and "saw that he had been living among horrors".[12] "Many of the 'beauties' are more terrible than the 'horrors'," charged the Art Journal.[13] The makers of the products which had been "gibbeted" raised such an outcry against the stigma officially placed on their goods that the section was eventually closed.[14]

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1 D.S.A. 1st Report lxi
2 Cole Address of November 1852
3 Edward Forbes quoted by J.C.Robinson op. cit.
4 J.C.Robinson Address of 1854
5 Redgrave Address of November 1852
6 D.P.A. 1st Report 33
7 Redgrave Address of November 1852
8 MS letter Phipps to Cole 10 September 1852
9 Robinson Address of 1854
10 Robinson N.C. June 1880
11 S.C.M. (1897) A.4221 (Purdon Clarke)
12 A House full of horrors. Household words December 1852
13 Art J. August 1854
14. Cole op. cit. I 286

The Museum was to be distinguished for three more innovations. Special temporary exhibitions were inaugurated with a display of furniture from the Great Exhibition in 1853.[1] A system of loans to local institutions began in the same year.[2] The third introduction, the preparation of reproductions of items from the collections, came later. A Library for the use of students and researchers was a feature of the Museum from its inception.[3]

In its early days, the Museum had a variety of names: "The Museum of Manufactures",[4] "The Museum of Ornamental Art",[5] the "Museum of Industrial Art"[6] and the "Industrial Museum",[7] were all usedat various times. From 1857, with the move to its final site, it became and remained for all save a few years of the rest of the century, the "South Kensington Museum".

Parliament was asked to consider "whether an adequate annual sum might not be properly invested towards the gradual formation of a systematic national collection which would appear to be ... unique in Europe".[8] This "annual sum" was granted, and eventually reached high figures: the outlay involved did not always meet with the general approval of Parliament. Gifts were also solicited, and while most of these were of outstanding value and importance, the indiscriminate acceptance of others led eventually,in the view of one critic,to "a vast omnium gatherum, without intelligent plan, or definite order".[9] The first and possibly the most important of these gifts was that of the "Sheepshanks Collection", not for its intrinsic value, which was later to be exceeded by that of other gifts, but because of the way in which it was used by Cole to further his plans.

Sheepshanks, a rich merchant and a friend of Redgrave, offered to give his pictures as "first fruits" of the "Gore House plan".[10] Either Redgrave or Cole persuaded Sheepshanks to insert two clauses in the deed of gift. One was that the collection should never leave Kensington, thus, in effect, ensuring the permanence on that site of any Museum which contained it. The second condition was that it should be open for public viewing on Sundays. Lord Stanley agreed to the deed only if this latter clause were made a request and not a condition.[11] The collection was handed over in 1857.[12]

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1 D.S.A. 1st Report liii
2 Ibid. lvii
3 MS.M 1. 96-99
4 D.P.A. 1st Report 30-32
5 Robinson Address of 1854
6 Wemyss Reid op. cit. 142
7 Redgrave Address of November 1853
8 D.P.A. 1st Report 31
9 J.C. Robinson On our National Museums and Art Galleries N.C. December 1892
10 Cole MS Diary 2 September 1852, 23 May 1853, 8 August 1856 and MS letter Cole to Grey 18 September 1852
11 MS letter Stanley to Cole 13 January 1857
12 D.S.A. 5th Report li

Loans, especially for temporary Exhibitions, were also a frequent feature. (They were "characteristic of the Museum", it was said in its early days.[1]) The Queen was the first to give such aid, which she repeated over the years.[2] The question of accessions was thus met. On the matter of maintenance, Cole was able to develop a measure of his cherished "self support", and admission charges were levied from the outset. In the early years, charges were sufficient to pay the attendants' wages.[3] The details of charges were not always tactfully given. "The swinish multitude are respectfully informed by its (sic) own servants that it may see something it has paid for", said Punch, in its first reference to the Department's activities.[4]

One problem in setting up the Museum was the distinction, if any, to be maintained between "high Art" and "industrial Art". Initially, it seems to have been argued that there should be no such distinction, especially as the "elevation of general taste" was so important. In 1863, however, Cole submitted a Memorandum on the subject to the Board,[5] and, as a result, it was announced that "future purchases would be confined to fine art applied to some purpose of utility".[6] This was done "to prevent the Museum developing in certain directions",[7] and was a direct outcome of a dispute on policy between Cole and Robinson, the Keeper. "We eschew the collecting of pictures, as pictures, which is a matter of fine art ... we try with the most religious faith to keep the Museum in a technical direction ... of Art in its application to industry", Cole said later.[8] The primary aim to the end of the century was "the instruction of students in design ... and the guidance of manufacturers and artisans",[9] with "fine Art as no part of the Museum's mission".[10]

This purpose was stressed frequently in the Commons, usually in the debates on the estimates. It was "not a Museum for fine Arts, but for instruction",[11] where "displays are calculated to stimulate inventive genius ... (and) to improve the art education of the working classes, not to deal with the higher branches of Art."[12] Its "special educational object" was "one which

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1 Engr. 18 March 1859
2 D.S.A. 1st Report li
3 Ibid. liv
4 Pch. (1853) 227
5 Cole op. cit. I 345
6 D.S.A. 11th Report 8
7 S.C.M. (1897) A. 294 (Donnelly)
8 S.C.S.I. AA. 866-867
9 R.C.T.I. AA. 2901-2977 (Cunliffe Owen)
10 S.C.M. (1897) A. 1412 (Sparkes)
11 Hd. CXLVI (1857) 585 (Cowper)
12 Hd. CLI (1858) 1173 (Cowper)

the artisans of the country could not receive without state aid".[1] It was "not a second national art collection" but was "primarily for art students",[2] and was "best seen as an industrial spur".[3]

Even the Engineer was prepared to admit that the Museum had had a good influence on design,as early as 1860.[4] It was "a great help to the artisan",[5] and "the extraordinary attendance" was "proof of the interest of the working classes".[6] General tributes to its influence were paid by leading artists, in a memorandum presented to the Select Committee on Museums in 1897[7], and in another memorandum when the relative "expansion areas" for Art and Science were under discussion in 1898.[8] It was the "workshop of the Central School of Art", believed Donnelly.[9] At least one of its founders, however, was in no doubt that "fine Art" was not inseparable from its purposes. The "development of a truly National Gallery of British Art" was seen by Redgrave as his "reward for years of severance from my profession".[10] The success of the Museum inspired other countries to set up their own Museums based on its model. The Paris Exhibition of 1878 particularly revealed its influence and acted as a spur to this action, said one defender.[11] Thirtyseven foreign Museums had been modelled on it, a later Director claimed.[12]

The fear that South Kensington was a remote and inaccessible part of London, expressed by the "learned societies" as one reason for opposition to the Consort's scheme that they might be grouped there, was shared in some quarters on the question of siting a Museum in the area.[13] It was the attraction, not the site, which regulated attendance, said Cole.[14] Even as late as 1879, in praising the Art Library, the Athenaeum believed that it was "remote" from the other national collections,[15] but by 1884 the Engineer said that it was probably more convenient for most readers than the British Museum.[16] South Kensington was chosen by the City and Guilds as the site for their Central Institution

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1 Hd. CLI (1858) 1180 (Adderley)
2 Hd. CCLXXIX (1883) 1910-1911 (Mundella)
3 Hd. XII (1893) 1312 (Acland)
4 Engr. 14 September 1860
5 N.A.P.S.S. 1876 Report 131 (W.H. James)
6 N.A.P.S.S. 1879 Report 189 (Sir W.Coutts Lindsay)
7 S.C.M. (1897) A.2001 (Donnelly)
8 Nat. 6 June 1898
9 S.C.M. (1897) A. 172
10 MS letter Redgrave to Cole 20 September 1870
11 M. of A. 1878 103 (G.Wallis)
12 R.C.T.I. A. 2901- (P.Clunliffe Owen)
13 Engr. 5 June 1857
14 Address of November 1857
15 Ath. 16 August 1879
16 Engr. 18 January 1884

largely because of the proximity to the collections, the Department argued in 1882,[1] and from that point, no criticisms of location appear to have been made.

ii) The Officials

Cole became official Director of the Museum on the move to South Kensington. With Redgrave, Philip Cunliffe Owen and J.C. Robinson, he directed purchases and ordered the collections. Much of the credit for the early organisation must go to the latter, but at the sametime it would appear that he must have been one of the most difficult and troublesomepersonalities in the Department's history. His appointment from his Potteries Headship to a post at the Central School is later recorded.[2] He was released from these duties after a year, and "placed in charge of the Museum ... and responsible to Mr. Cole for security".[3] He was officially appointed Curator in 1854[4], and Redgrave believed that his purchases were "judicious".[5] His "infirmity of temper" was noted by Redgrave[6], but this did not prevent his official appointment as Keeper in 1857.[7] By 1859 he was asking Cole about his prospects if Redgrave retired, and wanting the title of Director.[8] His insubordination over Diaries has been noted,[9] and he was also obstinate on the question of an official residence, which he saw as his right.[10] Robinson's connection with the Art Exhibition,which was one of the most successful features of the 1862 Exhibition,led to the first serious breach, when charges were made that he had been engaging in private dealing. He alleged that Cole had accused him of fraud[11], and was so "insolent" that Cole had to "order him from the room".[12] Macleod and Owen, who had been present, supported Cole in his account of that interview, and the Board added that Robinson's letter was "improper" and showed "a spirit of insubordination".[13]

The roots of the quarrel were much more deep, and were based on a dispute over the "applied art" function of the Museum. Robinson does not appear to have been convinced that this should set a limit to its activities, and he wished to have sole responsibility for its organisation. Granville tried to

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2 Chapter XI Section (A)(a)(iii)
1 D.S.A. 29th Report 13
3 MS.M 1.86
4 Ibid. 2.184
5 MS letter Redgrave to Cole 20 September 1854
6 MS letter Redgrave to Cole 29 December 1855
7 MS.M 6.113
8 Cole MS Diary 17 and 18 March 1859
9 Chapter III Section (b)(i)
10 MS.M 14.179
11 MS letter Robinson to Cole 30 January 1863 (MS.M 14.5)
12 Cole MS Diary 30 January 1863
13 MS.M 16.4

Sir John Robinson
by
J. J. Napier
(National Portrait Gallery)

make peace, and believed that while the Keeper's services should be retained, "he could be got rid of at any time".[1] Lowewas for dismissal, as "a man who is dissatisfied ... can be mischievous".[2] "My Lords" were "not prepared to discuss with a subordinate"[3], and Cole saw this as a reprimand to Robinson.[4] Further letters from Robinson brought the reply that he had acted without authority on purchases.[5] His application for retirement on pension met with a refusal, but his powers were diminished by appointing him to the special office of Art Referee, where his function would be to act as adviser on purchases.[6] When he again wished to resign, the Board said that his organisation of the Museum had been unsatisfactory, and a Memorandum was issued which specifically severed the Art Referee from any connection with the administration of the Museum.[7] Robinson accepted the post,[8] after Granville had wagered Lowe half a crown that he would not.[9]

"It is not pleasant for the Colonel to know that the Corporal he commands is a better soldier than himself", charged the Art Journal, and it added "To know little and to do little is the best recommendation to office at South Kensington".[10] The same journal said that Robinson was "about to be dismissed" later in the year,[11] and demanded an enquiry, but on this occasion Lowe was the pacifier, suggesting an even closer definition of Robinson's duties, and a "compact".[12] Robinson had to be reminded in 1865 that he must submit Reports through Cole,[13] but there were no further difficulties until 1867, when "this difficult case" had to be referred to the new Lord President, Marlborough.[14] ("Robinson would deal on his own account", Donnelly told Playfair thirty years later[15]) "Our friend Jack" was "deep in this, rejoicing over the melée", when the Department was being much criticised for its part in the Paris Exhibition in 1867,[16] and he was later thought to be"priming" W.H. Gregory, a

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1 Cole MS Diary 20 February 1863
2 Ibid. 3 March 1863
3 Ibid. 11 March 1863 and MS.M 16.52
4 Cole MS Diary 13 March 1863
5 MS.M 16.68
6 Ibid. 16.80
7 Ibid. 16.91-92
8 Ibid. 16.106
9 Cole MS Diary 24 April 1863
10 Art J. June 1863
11 Ibid. November 1863
12 MS letter Lowe to Cole 20 July 1864
13 MS.M 20.61
14 MS letter Redgrave to Cole 6 March 1867
15 MS.letter Donnelly to Playfair 20 November 1897
16 MS letter Redgrave to Cole 15 March 1867

critic of the Department.[1] While Granville thought "it would be a mistake to have a row with Robinson"[2] after the Art Referee had been Macleod about another imputation on his honesty,[3] Cole later noted the abolition of Robinson's office.[4] The Art Journal hinted at a liberal pension, as "Robinson must go because the King wills it".[5]

Seymour Haden,[6] art amateur and successful surgeon, and Honorary Surgeon to the Department until his resignation in 1867, was an influential friend of Robinson's and later supported his application for other posts.[7] A connection with Gladstone was hinted at by Granville,[8] and Cole's friend Layard went further, declaring that "Gladstone believed that Robinson was the most able man in Europe.[9] Robinson's later appointment as Surveyor of the Queen's Pictures (which revealed how much in decline was Cole's influence by that time) was attributed by Cole to Gladstone's influence.[10] On the latter appointment, Robinson was lauded as "the one to whom we all owe so much for what he did to form the Museum",[11] and he was later given the credit for the success of the 1862 Loan Exhibition.[12] Redgrave had to write to an unspecified newspaper because he believed that Robinson was claiming to have been the sole originator of the Museum,[13] but after Redgrave's death, Robinson was in fact given such credit once more.[14]

With his resignation, Robinson became one of the most virulent critics of the Department. "The meaningless and absurd term 'Practical Art' invented as a concrete designation for ... nebulous doctrines,... crude, hasty, impracticable schemes ... the useless expenditure of large sums of public money", summed up his views.[15] He was behind the temporary move of "modern Art" to Bethnal Green in 1880,[16] Cole believed, and Elcho ended a letter to Cole at the time with the words "Vive Robinson".[17] Later imputations on his honesty, in 1887, have been recorded. He must have been a powerful source of

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1. MS letter Redgrave to Cole 29 July 1867 (Gregory later told Cole that he thought Robinson was "a maniac in his conceit", and two years later said that he had "found out how troublesome and impracticable he was, and how he must have grieved me." [Cole MS Diary 7 March 1868 and 23 May 1870])
2. MS letter Granville to Cole 4 January 1868
3. Cole MS Diary 4 January 1868
4. Ibid. 12 August 1868
5. Art J. January 1868
6. Biographical Appendix
7. MS letter Percy to Cole 21 February 1871
8. MS letter Granville to Cole n.d. January 1863
9. Cole MS Diary 21 February 1868
10. Ibid. 19 December 1880
11. Ath. 8 January 1881
12. Ibid. 22 April 1882
13. MS letter Redgrave to Cole 28 December 1877
14. Ath. 2 November 1888
15. Robinson N.C. June 1880
16. MS letter Cole to Spencer 20 December 1880
17. MS letter Elcho to Cole 22 February 1881

criticism of the Department in the influential circles in which he moved. His part in the campaign which led up to the appointment of the Select Committee on the Museums of the Department, at the end of the century, has been noted.[1] With Robinson's departure from the scene, the way was open for Cole to develop his policies without hindrance: they were not notably amended by his successors. Philip Cunliffe Owen succeeded Cole on his retirement in 1873, and served for twenty years. On Owen's retirement, the office was separated into two sections, and J.H.Middleton, Slade Professor and Director of the Fitzwilliam Museum[2], took over responsibility for the Art Collections.[3] Middleton died in 1896, and was succeeded by C. Purdon Clarke,[4] who served until the turn of the century.

iii) General administration

A Select Committee of the House of Commons was set up in 1860 to consider the question of the administration of the Museum.[5] Before the Committee, Cole argued that the principal reason for its existence was "its connection with the School".[6] The Committee finally "passed a very satisfactory Report, lauding our doings", recorded Redgrave.[7] The Engineer complimented the Department on "coming well out of the ordeal", and said that it had had much provincial support.[8]

One cause of opposition to the Department was the fear that it was intent on taking over other institutions. The Department was later in its turn faced by attempts to remove the Museum from its administration. Just before Cole retired in 1873, he was told by Ripon of a scheme to transfer responsibility to the trustees of the British Museum.[9] He met Winton Jones, of that Museum, and noted that he "was flushed at saying that Lowe had sent him". "Lowe would never succeed in putting trustees in place of parliamentary responsibility", Cole told Jones directly.[10] Cole's determined fight to save "his" Museum has been recorded.[11] "These blokes made up their minds, passed Minutes, communicated with the British Museum trustees, etc., of course without telling us ... to hand over the Museum in November", Donnelly told Huxley when

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1 Chapter V Section (g)(ii)
2 D.N.B.
3 D.S.A.O.B. 9 July 1893
4 Art J. 1896 250
5 Hd. CLIX (1860) 724-728 and P.P. (1860) XVI (527)
6 Cole op. cit. I 339
7 Redgrave op. cit. Diary of 14 October 1860
8 Engr. 14 and 28 September 1860
9 Cole MS Diary 7 July 1873
10 Ibid. 22 July 1873
11 Chapter IV Section (b)(iii)

he asked him for his aid to thwart the plan. He called the scheme "an absurdity" and said that he had "made an internal vow to stop the business".[1] Hooker asked Huxley if there was any truth in the rumours.[2] The plan appears to have sprung from the mind of Robert Lowe: he was the only member of the Cabinet who was keen on the transfer of authority, and the trustees were not "over desirous for the change", Walpole, the M.P. responsible for representing the trustees in the Commons, told Playfair, who passed the news to Cole.[3] The Athenaeum thought that the plan would go through,[4] but Nature saw it as "impossible", pictured "Science and Art under the Archbishop", and said that "Cabinet interests want the trustees as buffers to energy".[5]

The "Treasury tried to force this", said Donnelly later.[6] He became a member of an inter-Departmental Committee which considered the plan, and talked over his lines of approach with Cole.[7] The Committee found the plan "impossible", and "never recommended amalgamation with the British Museum.[8] Playfair's intimation to Forster that "such a junction would stand in the way of schemes for a Ministry of Education"[9] was probably a potent factor in the decision to drop the scheme. It eventually died with the fall from power of Lowe, and, later, of the Gladstone government in 1874. There were momentary revivals of such a scheme in later years,[10] but the Select Committee on Administration heard little evidence on the Museums,[11] and made no recommendation on the subject. The Museums Committee at the end of the century, which heard Donnelly argue strongly against such a move,[12] made no recommendations on transfer or severance. In fact, the Department and the British Museum authorities would appear to have worked well together, reaching agreement on rules for bidding at auctions, after charges of counter-bidding,[13] which gave South Kensington "first choice of antiquities connected with manufactures".[14] There were charges that "counter-bidding" was still going on, despite these

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1 MS letter Donnelly to Huxley 14 August 1873
2 MS letter J.D.Hooker to Huxley 8 August 1873
3 MS letter Playfair to Cole 10 October 1873
4 Ath. 9 August 1873
5 Nat. 6 November 1873
6 S.C.M. (1897) A. 1873
7 Cole MS Diary 28 October and 7 November 1873
8 S.C.M. (1897) AA. 1770 and 1873 (Donnelly)
9 MS letter Playfair to Cole 13 October 1873
10 R.C.T.I. A. 1481 (Sparkes), Hd. CCCIX (1887) 1560 (Labouchere), M. of A. 1890 100 (E.F. Strange)
11 Lord George Hamilton argued, conversely, that the Department should take over responsibility for the purchases of the British Museum. (S.C.M. (1897) A. 814)
12 S.C.M. (1897) A. 1776
13 Hd. CXLVI (1857) 571 (Elcho) and Hd. CLI (1858) 1175 (Norrys)
14 Hd. CLXXVI (1864) 1090 (Walpole)

rules, for the rest of the century, and officials and politicians had frequently to deny them.[1] On Donnelly's accession to office, eleven Committees of experts were appointed to advise and report on the collections and purchases.[2] The system of Art Referees was revived in 1884,"to enable the best development as a teaching establishment",and in the same year a "General Council" of leading artists was formed. It was claimed that members of staff were "promoted entirely by reference to their aptitude for administrative duties",and that the total of staff was kept as low as was possible.[3] The officers "deserve hearty admiration ... for their efficiency", believed Nature, but it added that they also needed expert help.[4]

The campaign which led to the setting up of the Select Committees of 1897 and 1898 has been recorded.[5] The Committee believed that the Museums had "grown from small beginnings under the influence of external circumstances rather than by the guidance of a consistent policy". It recommended "A Board of visitors to rehabilitate its prestige", but as has been noted, did not recommend a "severance" from the Department.[6] The officials could have claimed, with truth, that the policy on the Museum had been "consistent" and planned, from the day of its foundation.

iv) Causes of opposition

The Museum was the cause of much criticism of the Department, and of opposition from those who doubted its essential existence. Another factor in discontent was the support given by its officials to schemes of Sunday opening, which they saw as a natural consequence of the evening opening in which the Museum was a pioneer. Sunday opening was seen as giving "indirect support to a practical tendency to demoralise the community".[7] The matter was considered by the Board in 1857[8] at a time when it was first raised in Parliament.[9] It received further consideration in the Commons, as part of schemes for the general Sunday opening of Museums, on several occasions in the next four decades.[10] In 1896, an Act which permitted Sunday opening was passed after a sitting which lasted until 2.00 a.m.[11] South Kensington and the

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1 Hd. CLXXXIV(1866) 1560 (Lowe), S.C.A.E.S.A. AA. 149-150 (Sandford), Ibid. A.1657 (E.A.Bond), S.C.M. (1897) A.4029 (Purdon Clarke)
2 D.S.A. 30th Report 2
3 D.S.A. 32nd Report xviii-xix
4 Nat. 10 October 1889
5 Chapter V Section (g)
6 S.C.M. (1898) lxvii and li
7 Hd. CLV (1859) 374 (E.Ball)
8 MS.M 7.208
9 Hd. CXLVI (1857) 582 (John Locke)
10 Hd. CLV (1859) 368-370, Hd. CLXI (1860) 1549, Hd. CCLIV (1880)2050 Hd.CCLXIX (1882) 1148-1189, Hd.CCCLI (1891) 1595-1596, Hd.XIV (1893) 50
11 Hd. XXXVIII (1896) 617-651

Bethnal Green were the first Museums to open on Sundays, as a result.[1] Thus, it had taken nearly forty years to fulfil the Sheepshanks request.[2]

A second reason for opposition appears to have been the belief that the officials of the Department were engaged in a process of "empire building" which involved the take-over of any other institutions which could be seen to fit into its sphere. Thus, when schemes were afoot to set up a separate Natural History Museum from the swollen resources of the British Museum, fears were expressed that the creation of such a collection at Kensington, where there was room for expansion, would involve direction by the Department. Huxley's friend, J.D.Hooker, believed that such a conspiracy was being planned in 1858, and wanted "any compromise to keep out of the Kensington Gore people's clutches".[3] Ten years later, a memorandum signed by Huxley, Hooker and Darwin, among others, said that location of such a collection was a secondary matter to its administration.[4] Fears were still expressed in the Commons during the period when the building was being erected at Kensington, and the issue was probably complicated by the fact that the original plans for the structure were based on designs by Fowke.[5] In fact, Cole actually preferred a plan to build the Museum on the Embankment.[6] Huxley had to announce publicly that the Kensington plan was not his alone.[7] It was later implied that the Department was behind the setting up of the Imperial Institute, with its own laboratories, lecture and examination rooms.[8] Rather than "expend huge sums on buildings of their own", it was suggested that the Department should "take over this white elephant".[9] The Institute was "a failure" ... seen from the first as a South Kensington job", in the eyes of some critics.[10]

The take-over of such collections as those of the Patent Museum, the Architectural Museum, accessions from the India Museum, and the foundation of the "National Gallery of British Portraits",could be seen as giving grounds for such concern. Conversely, it was believed that the Department actively opposed any schemes for development which were not its own. "Art has friends and foes, and the munificence of the former is threatened by the red tape of

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1 Art J. 1896 96
2 Section (c)(i)
3 MS letter J.D.Hooker to Huxley 18 June 1858
4 Hd. CXCI (1868) 388
5 Hd. CCXII (1872) 736-745
6 Cole MS Diary 17 January 1869 and MS letter Cole to Huxley 13 May 1870
7 Times 11 April 1876
8 Nat. 29 October 1896
9 Engr. 6 August 1896
10 Ibid. 15 April 1898

the latter", said Punch,[1] of the offer by Tate to erect a "Gallery of Modern British Art" at South Kensington. This was opposed by the Department, because its own success had by this time rendered space, which was needed for expansion, at a premium.

Cole's advocacy of the appointment of one Minister to be in charge of all National Museums could have inspired fears, too: it may well have been believed that if such a post were ever created, that Cole would be the "man behind the Minister". He linked this creation with that of a "Minister of Education", and prepared a Memorandum which argued forcibly for this move.[2] He inspired Lord Henry Lennox to bring forward a motion for this appointment, but it was withdrawn.[3] Like so many of Cole's ideas, it was ahead of its time, although it had other supporters.[4]

v) Accommodation

As its collections continued to grow, the Museum was increasingly beset by problems of accommodation, and this did not always fit well with its role as an agency for the improvement of the "national taste". Gore House, the former home of Lady Blessington, after a period of use for the Art School, was "levelled to the ground",[5] and the transfer of "all the property of the Department" took place in 1857.[6] The Department was particularly unlucky in the design of the buildings erected for its use. Built on the pre-fabricated principle which was Paxton's great contribution to architecture, their design was planned by the Office of Works.[7] Cole disclaimed any responsibility for them, and called them "That unlucky iron shed which will prove a most unfortunate thorn ... I expect all its ugliness is laid upon my Department ... we must be mute upon that point and also on its radical defects".[8] "Bare functionalism, without architectural control",[9] they were soon christened "The Brompton Boilers",[10] "because of their waggon-headed roofs."[11] They were, said the Athenaeum,

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1 Pch. 2 August 1890
2 S.C.S.I. A. 9119 and Appendix., S.C.A. Appendix II
3 Hd. CLXV (1862) 1750-1802
4 Hd. CLXXXIX (1867) 639 (Beresford Hope), MS letter Adderley to Huxley 22 December 1868, S.C.A. A. 1115 (Mundella)
5 Edmund Yates: About Kensington Gore F.R. XXXIX (January - June 1886) 398-403. Philip Cunliffe Owen later recalled "starting a brace of partridge" in the grounds in these early days. (Art J. 1891 213)
6 P.M. 107.2871 (The move officially took effect on 30 April 1857)
7 MS letter Redgrave to Cole 12 July 1856
8 MS letter Cole to Grey n.d. August 1856
9 Henry-Russell Hitchcock: High Victorian Gothic Victorian Studies(University of Indiana Bloomington 1956) I 50
10 The invention of the term is usually attributed to Punch, which made great play with it later, but it was not used in that journal in 1856. The first reference in current literature would appear to be that in the Athenaeum.
11 S.C.M. (1897)(Sir John Taylor, Principal Surveyor, Office of Works.)(A.7335)

"very like three boilers ... painted in calico stripes of green and white ...", and they were a "monstrosity" which "warned students of design by setting up for their wonderment a perpetual eyesore".[1] Elcho "would not speak of the South Kensington Museum, but would use the better known and more euphonous (sic) epithet of "Brompton Boilers",[2] and "Boilers" they remained. They were, Playfair believed,"an edifice of corrugated iron".[3] A critic said that they were a "monstrous architectural abortion" which did "not say much for (the Department's) taste and knowledge".[4] Even when part of the structure was transferred to Bethnal Green, Nature contrasted "the magnificence of the Art collections inside with the Boilers outside".[5]

Whatever may have been the criticisms of the administration, and however poor the accommodation might have been, the Museum authorities were forward looking in their methods. First experiments in the use of electric lighting were made as early as 1879[6], and in 1882 the system was generally adopted "because of the great advantage in the absence of heat and noxious fumes".[7] (Leighton, the P.R.A., was later particularly pleased, as he had "feared for his murals under gas-lighting".[8]) Telephones were installed in 1886 "as an improvement in security ... after years of correspondence with the Treasury and the Office of Works".[9] The Museum "came nearer than any other gallery to the plain practical ideal in its setting out of displays",[10] and while an innovation of labelling purchases with their prices was seen as an incitement to theft[11], a Select Committee on the ordering of the Collections reported favourably in 1890.[12]

The problems of accommodation were not eased by a general policy of acquisitiveness and readiness to accept almost any collection which was offered. An "Education Museum" was formed, with a nucleus of material from a Society of Arts Exhibition in 1854.[13] By 1857 the collection embraced 3,200 books, and 1,300 pamphlets and included models, apparatus and furniture.[14] The Engineer

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1 Ath. 18 October 1856
2 Hd. CLI (1858) 1175
3 Wemyss Reid op. cit. 142
4 Hd. CLXV (1862) 1793 (Coningham)
5 Nat. 10 October 1889
6 D.S.A. 27th Report 530
7 D.S.A. 30th Report xv
8 Engg. 30 September 1887
9 D.S.A. 33rd Report 274
10 F.R. II (August-November) 1865 90-102
11 S. and A. October 1891
12 Hd. CCCXXXII (1888) 896-897 and P.P. (1890) XXI (21)
13 Hudson and Luckhurst op. cit. 236, Cole MS Diary 8 October 1854, and D.S.A. 4th Report xxxiii
14 D.S.A. 5th Report 75

hoped that text-books exhibited would help to break "certain monopolies".[1] By 1865,the collection had risen to 18,700 books,and enlargement was no longer possible due to "restrictions of space".[2] By 1883 there were 45,099 books.[3] The collection of furniture and models was not dispersed until 1889, on the recommendation of the Treasury Committee of that year,[4] and the last of the books was not cleared until 1897.[5]

For a brief period, an "Architectural" collection was housed in the Museum. "The Architectural Museum" asked for aid in 1854. The Consort favoured the move[6], and a satirical account of its transfer was published by the Engineer.[7] The association was short-lived: Lowe approved the termination of the agreement in January 1860.[8] The Department was also concerned with the initial formation of a National Portrait Gallery. The first proposal was made in 1862.[9] In 1865, the Department arranged a "National Portrait Exhibition".[10] "We are merely watchmen",[11] said Cole, and the collection was later transferred from the Department to find its eventual home adjacent to the National Gallery. The Museum also took over,on permanent loan,the "artistic" objects of the Museum of the defunct East India Company, after negotiations which lasted for several years.[12] The exhibits were taken over in November 1877[13], and were eventually housed in a special annexe,which was opened by the Queen in May 1880.[14]

As early as 1858 the Engineer called the Museum an "incongruous mixture"[15], and twenty eight years later commented "the collections are too large, and there is much rubbish, much of it collected because the Department is afraid of other agencies".[16] When it is considered that in the same "Boilers", sheds and cabins the Department was also housing the objects which later formed the separate Science Collections, such a non-selective policy would appear to have been on the whole, misguided, and, here perhaps, the 1898 Committee did speak with truth.

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1 Engr. 15 January 1858
2 D.S.A. 12th Report xiii
3 D.S.A. 30th Report xx
4 D.S.A. 36th Report xxxi and Nat. 29 August 1889
5 D.S.A. 44th Report xlix
6 MS letters Grey to Cole 29 May 1856, 16 April 1858 and 19 May 1859
7 Engr. 13 August 1858
8 Cole MS Diary 19 January 1860
9 MS letter Gladstone to Granville 5 June 1862
10 P.M. U.193 and D.S.A. 13th Report 27
11 S.C.S.I. A. 9145
12 MS letters J.W.Bartle Frere to Cole 19 December 1867, Perry to Cole 18 March 1869, Bartle Frere to Cole 10 April 1869. Ath. 27 January 1872. Nat. 2 April 1874, 28 January 1875, 27 May 1875.
13 Nat. 20 November 1877.
14 D.S.A. 27th Report 527 and 28th Report xviii
15 Engr. 18 May 1858
16 Ibid. 20 August 1886

While Cole argued in 1864 that "if permanent and secure buildings could be erected, the country will see the total of the vote"[1], treatment by successive governments led the Museums Committee at the end of the century to sneer that "the very nature of its buildings show that it has not hitherto won the confidence of the Exchequer"[2]. New estimates were approved by the Treasury, of £195,000 to be spent over six years, in 1866[3], but "progress was not as rapid as was hoped". "Delay of building for want of funds" was reported in 1870[4]. From that year, responsibility for new buildings was transferred to the Office of Works. Ripon believed "that the Department would be better off"[5], but Cole no doubt with the dreadful example of the "Boilers" in mind, was careful to "settle with Scott" (the Department's own architect) "that all points of taste would be settled first with the Department"[6]. From that time, separate annual estimates for buildings were submitted, and these were often the occasion for Parliamentary criticisms which were not always restricted to this topic.

There was some new building in 1882, but only a limited amount of capital was provided[7]. One entrance "could be the entrance to a beer-hole or cellar"[8]. After complaints in the House by friends of the Department[9], £354,896 was eventually voted[10] but "The Treasury hesitated at the magnitude of the work"[11]. "A pressing need for space" made "proper display of the collections impossible"[12]. Nothing transpired for several years, and protests mounted. Critics of successive governments attacked them for their parsimony[13]. "The general squalor of the Museum humiliates the Nation", Playfair argued[14]. A Punch cartoon showed a figure of "Art" outside the "Boilers", while Mr. Punch suggested to John Bull that "Surely in the Diamond Jubilee Year you will find a home for her"[15]. The "hideous building at South Kensington"[16] was finally improved as a consequence of the hearings of the Museums Committee, which resulted in the removal of the

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1 S.C.S.A. A.255
2 S.C.M. (1898) lxvii
3 D.S.A. 14th Report 15
4 D.S.A. 17th Report xv
5 Cole MS Diary 18 February 1870
6 Ibid. 26 June 1871
7 D.S.A. 28th Report xviii and 29th Report xxv
8 M. of A. 1887 7-8
9 Hd. CCCXXIV (1888) (Mundella and W.H.James) 621-628. Hd. CCCXXXIV (1889) 31 (Kenrick). Hd. CCCXLI (1890) 1196 (Bartley)
10 Hd. CCCXLVIII (1893) 896
11 Hd. XII (1893) 1307. Lefevre, of the Office of Works [Donnelly had believed that he was "a pendant prig") to Rosebery. (MS letter Donnelly to Huxley 17 August 1885]
12 D.S.A. 39th Report xxxv and 40th Report 5
13 Hd. XVIII (1893) 532, XIX (1893) 105, XX (1893) 264, XXII (1894) 1064-1081, XXIII (1894) 1573, XXIV (1895) 1205-1208
14 Wemyss Reid op. cit. 455
15 Pch. 13 March 1897
16 S.M. June 1896 (XI 177)

"Boilers" and other temporary buildings because of the fire risk,[1] in 1898. A "permanent building plan" was "hoped for soon" in that year.[2] The foundation stone of new buildings was laid by the Queen, as one of her last public acts, on 17 May 1899.[3] The name of "Victoria and Albert Museum" would later be bestowed, and the Commons were told in 1900 that there was "now one great Central Museum ... with valuable and important collections".[4] After years of procrastination, proper accommodation was thus finally provided, but this was not until after the Department had ceased to exist.

d) District Museums

The theory behind the creation of District Museums in various parts of the Metropolis was that they should be "each of a distinguishing character, and not merely a replica of the Central Museum".[5] There were deputations from 1860 to 1865 from both North London and South London,[6] but only in one area, "East London", was a District Museum developed.[7] Cole found unexpected allies in Ayrton[8] and Gladstone, although the latter was of the belief that there should be no government grants for maintenance of such Museums.[9] Cowper, the Vice President, favoured the idea.[10] Brady, a local M.P., was a keen supporter of the scheme[11], although Cole had to tell him that "it can only have what the parent Museum has, with no Geology or Natural History".[12] Local clergymen, "the beggars of Bethnal Green"[13], raised money for the purchase of land, and an "East London Museum Bill" was passed,[14] to enable the erection of a building which used some of the "Boilers" material.[15]

Although the Treasury had approved the creation of the Museum in 1867,[16] it suffered from Lowe's "economy schemes", and "a Treasury letter repudiating maintenance" was received in 1869.[17] The premises became "dirty and neglected"[18],

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1 Nat. 14 February 1898
2 Hd.LIII (1898) 487 (Akers Douglas, Office of Works)
3 Nat. 18 May 1899
4 Hd. LXXXIV (1900) 169 (Gorst)
5 Cole op. cit. I 355
6 MS.M 18.165 and 19.99
7 Cole advised a South London Committee to "obtain the rest of the Boilers" in 1874 (Cole MS Diary 5 November 1874) but there were no developments in this area.
8 Cole MS Diary 1 July 1864 and 18 November 1865
9 MS letter Gladstone to Cole 2 August 1865
10 Cole MS Diary 31 March and 13 September 1865
11 Ibid. 17 November 1866 and 26 August 1867 and P.P. (1872) XLVI (759)
12 Ibid. 21 January 1869
13 Pch. 4 January 1868
14 D.S.A. 19th Report xxiv
15 D.S.A. 12th Report 7-8, 20-21
16 D.S.A. 14th Report xviii
17 Cole MS Diary 30 December 1869
18 Ibid. 10 January 1871.

and Cole was told that Lowe had "offered the building as a Trades University ... and would not spare a shilling for Cole's hens and chickens".[1] The expenses of the official opening were not allowed by Lowe[2] until Ripon and Forster said that they would bear them themselves.[3] An inaugural Exhibition of the Wallace Collection, arranged by Cunliffe Owen,[4] gave the Museum great initial success.[5] Local inhabitants who visited the Museum were "distinguished by their courtesy",[6] and the Department was praised for "bringing the first sign of a collective or liberal existence to that depressed community".[7]

The Museum received the "modern" works of art from South Kensington on a temporary basis in 1881,[8] and also had the permanent custody of the original Food and Animal Products Collections.[9] It was asked "when would the Museum become artistic as well as useful?"[10] and there were suggestions that it should be handed over to the local School of Art.[11] The Museum was offered to the L.C.C. in 1893, but was refused, said the Museums Committee in 1898, and they called it "a receptacle of the second rate ... of little use to an exclusively artisan community".[12] It was seen as "metropolitan and by no means national",[13] and "a bid for popularity which failed".[14] The charge that it was second-rate was vigorously denied by Donnelly, in his observations on the Museums Committee's Report,[15] but it never seems to have developed a "distinguishing character" in the Department's life-time.

e) Relations with provincial Schools and Museums

i) Early attempts at encouragement

Cole saw the Central Museum as a fore-runner of local Museums,[16] and Robinson looked forward to the distribution of "superfluous specimens to local collections".[17] The 1836 Committee had recommended loans to provincial Museums,[18] and these had begun, from the embryo Museum of the School of Design, soon after

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1 Cole MS Diary 31 January 1871
2 Ibid. 26 April 1872
3 Ibid. 15 June 1872
4 MS letter Owen to Cole 1 April 1872
5 D.S.A. 19th Report xxiv and 20th Report 456
6 Art J. August 1872
7 F.R. (January - December) 1872 466 (Sidney Colvin)
8 D.S.A. 28th Report xxi, and MS letter Cole to Spencer 23 December 1880.
9 D.S.A. 20th Report xxiv
10 Hd. CCLXXXIII (1883) 403 (Ritchie)
11 N.A.P.S.S. 1884 Report (Walter Besant)
12 S.C.M. Second Report 1898 xxx
13 Hd. CCXXXV (1877) 1349 (J. Chamberlain)
14 Ath. 20 August 1898
15 P.P. (1899) LXXVI 587
16 Cole Address of November 1852
17 Robinson Address of 1854
18 S.C.S.A. A. 3634 (Eastlake)

its inception,[1] but were discontinued because of "defective organisation".[2] As a first step, soon after the foundation of the Department, a special "Travelling Museum" was fitted up in a special railway truck[3] and was sent on tour of local Schools.[4] (This was done despite the Consort's lack of enthusiasm, on the grounds of risk)[5] Although this "Museum" was initially welcomed as "a huge hammer to break up ... convention and ignorance",[6] it was a relative failure, chiefly because the receiving Schools and later, Museums, had to pay the transport costs and a fee to the "attendant". It was denounced as "mere crockery"[7] and generally condemned before the 1864 Committee,[8] which noted that it was "far from perfection".[9] It was disbanded in that year.[10]

Loans were first made in connection with special exhibitions which were set up in local Schools of Art. They were seen by some, however, as "unasked for impertinences" and "mere palliatives".[11] Schools claimed that they were difficult to obtain and were of little value when received.[12] (The Museum should be broken up,said Sparkes, because in its centralised form it was "useless to students".[13]) The British Museum and the National Gallery made no loans at all, said Cole, and he argued that the Museum was "spreading taste" by its loan system.[14] There was, however, an effort to improve the system after 1864, and the term "circulation" seems to have been freely used to cover both the issue of permanently moving special collections, or for single loans. The elimination of objects not needed centrally, the sale of chromo-lithographic reproductions to Schools, and loans to Museums independent of Schools, were first mooted in that year.[15] From that point, the question of "circulation" must be seen against the development of local Museums as such.

ii) The Department and the development of local Museums

A local rate could be raised for the support of local Museums,[16] and the demand for these increased with the growth in the provision of Art Schools.[17]

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1 S.C.M. (1897) A. 167 (Donnelly)
2 Report on the system of circulation of Art Objects on loan 1881 P.P. (1881) LXXIII (525) 2
3 Ibid. 3
4 D.S.A. 3rd Report xiv
5 MS letter Phipps to Cole 1 October 1856
6 Ath. 3 February 1855
7 S.C.S.A. A. 3225 (Brenan)
8 Ibid. A. 1693 (Bacon) A. 3901 (Hollins) AA. 1097-1098 (Sparkes)
9 Ibid. xvii
10 R.C.T.I. A. 2910 (Cunliffe Owen)
11 Engr. 21 May 1858
12 S.C.S.A. A.1414 (Sparkes)
13 Ibid. AA. 1408 and 790
14 Ibid. AA. 4315 and 4457
15 D.S.A. 11th Report xii
16 Public Libraries and Museums Act 1855 18 and 19 Vict. C.40 (Ireland) C.90
17 Engr. 18 February 1859

(Cole was, of course, strongly in favour of their extension[1], and the 1864 Committee noted his "valuable suggestions"[2]) The Museums and Libraries Association was a powerful pressure group,[3] and their connection with the "new" Universities, with "South Kensington as the model",was proposed in 1873.[4]

Proposals that grants in aid should be made to support local Museums were first made to the Commons in 1881. On that occasion, Jesse Collings, the proposer, complimented the Department on its system of loans, but said that local authorities were "taxing themselves to the limits of their power". He was asked to withdraw his proposal by Mundella, who said "South Kensington is too successful: every town now wants its own Museum". Collings' motion was defeated,[5] but one consequence was the development of loans to Museums independently of any connection with Schools of Art,[6] which drew the favourable comment that this was likely to encourage private support.[7] The Department saw the loans system as a means of providing variety in local Collections which a simple money grant would not ensure: in claiming in 1881 that the central Museum was "a great national storehouse", it reported that on yearly average, nine Museums and ten special Exhibitions availed themselves of its services "plus innumerable Schools of Art".[8]

A further unsuccessful attempt to obtain direct grants was made by Collings in 1882. On this occasion,several speakers voiced discontent at the "London monopoly", but there were plaudits, including one from Gladstone, who paid a tribute to the "new and highly beneficial scheme" of "the Department at South Kensington".[9]

iii) Provincial criticisms

This movement must be seen against the provincial objections to preferential treatment to the Metropolis. "The provinces starve while the Museum thrives", it was alleged.[10] "The Museum should be sacked and its spoils distributed to the provinces",[11] "The Boilers waxed fat while the provinces starved",[12] there was "provincial economy in the face of Museum extravagance", and

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1 Memorandum of 1867 (S.C.S.I. Appendix)
2 S.C.S.A. xvii
3 Engg. 31 August 1868
4 N.A.P.S.S. 1873 Report 64-88 (Professor W.B. Hodgson)
5 Hd. CCLXIV (1881) 1236-1264
6 D.S.A. 28th Report xix
7 Art J. 1881 254
8 Loans Report 1881 8 and 10
9 Hd. CCLXVIII (1882) 576-596
10 N.A.P.S.S. 1864 Report 480-481 (J.C.Swallow, York master)
11 ed. J.Timmins The Birmingham and Midland Hardware District (London Hardwick 1866) 370
12 Pch. 9 March 1867

there prevailed "provincial starvation versus the Museum raree show".[1] Witnesses before the Select Committee in 1864 made this charge[2], and the Committee recommended a separation of votes in the published accounts to end these suspicions.[3] "Poor Ireland's starvation" was contrasted with Museum "extravagance"[4], and the point was made that the Museum was wrongly located, since London was not a centre of industry.[5] The Art Journal, of course, supported the provinces:[6] the Department's defence was that its system of "circulation" gave the provinces full benefit[7], and it said that its advisory services were always available. Cole claimed at the opening of the Nottingham Museum in 1872 that the Department had been "bawling to give aid for years[8], and the organisation there, it was noted, followed the Kensington pattern even to the design of the cases.[9] He "showed Birmingham how to make a Museum"in 1868.[10]

v) Increased aid

Grants to local Museums on the cost of reproductions, copies, and cases were made from 1882[11], and the Department resisted Treasury pressure to give up its practice of bearing the full costs of transport of loans.[12] In order to qualify for loans, Museums had to be open without entrance charge at certain times.[13] Local manufacturers' support was increasing, said Cunliffe Owen in 1882,[14] when the Royal Commission on Technical Instruction applauded the Department's system of loans and aid.[15]

A loans system was developed by both the National Gallery and the British Museum, said Mundella, who wished these to be under the Department's control, in "its most important role",[16] and he found support in his belief on the importance of this function from Poynter.[17] (William Morris was an opponent on the grounds of risk,and the fact that "withdrawals made the metropolitan collections incomplete".[18]) The "whole of the Museum" was available for

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1 Hd. CLXXVI (1864) 560-561 (T.Bazley and J.F.Maguire)
2 S.C.S.A. A. 1576 (Brewtnall) and A. 2007 (Bacon)
3 Ibid. xvii
4 Hd. CLXXIX (1865) 1176 (Scully)
5 N.A.P.S.S. 1874 Report 211 (S. Neelson)
6 Art J. June 1875 173
7 S.C.S.A. AA. 4315 and 4457 (Cole) and R.C.T.I. A.2932 (Cunliffe Owen)
8 Art J. August 1872
9 M. of A. 1878 I 229
10 Cole MS Diary 26 February 1868
11 D.S.A. 30th Report 505
12 D.S.A. 32nd Report 2
13 D.S.A. 33rd Report 275
14 R.C.T.I. A. 2923
15 Ibid. 521
16 S.C.A. A. 1115 (Mundella)
17 N.A.P.S.S. 1876 Report 107
18 R.C.T.I. A. 1609

circulation, estimates were usually overspent because of demands, value for circulation was a prime factor in purchase, and "nothing is too good for this purpose", Cunliffe Owen argued.[1]

It was an "open secret" that Collings wished to "convert the National Museums into purely loan collections", said the Art Journal.[2] He continued to be unsuccessful in his campaign for state aid on a wider scale.[3] In 1889 even the relatively small vote for aid by the Department was removed from the estimates[4], to be replaced in 1893 after frequent representations by Collings[5], but it shared in a general reduction of the estimates.[6] Local museums found help from the "Whisky Money": "they could do with some of the beer money", the President of their Association said in 1893[7], and by the end of that decade this source was in fact being tapped.[8]

Despite the Department's efforts, criticisms of its system of loans grew progressively greater in the last years of its existence. Collings, once a defender, pleaded for more "circulation", and a better system, saying that its administration did not "command the approval of provincial Museums", and charging that "of late years South Kensington has been carried on with hide bound officialism".[9] The Museums Committee in 1897 heard accusations quoted from a number of newspapers of "grossest stupidity", "egregious blunders", "a triumphal progress of stupidity", and "incompetence".[10] Donnelly, in defence, described the system as "unique", said that about a quarter of the Museum's stock was on loan in 1895, and quoted many letters of thanks from local Museums and from the Museums Association.[11] There had been a revival of local industries as a result of "loans of textiles to Birmingham, and ironwork to Nottingham", which had received such items on request, and not because the Department had been guilty of stupidity in sending them there, claimed another official.[12] Figures for 1895 showed that eleven officials were fully occupied with the loans system, and seven vans had travelled a total of 17,786 miles with items in that year.[13]

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1 R.C.T.I. AA. 2910-2988
2 Art J. 1883 23
3 Hd. CCCXXXII (1888) 629-630
4 D.S.A. 37th Report xxxix
5 Hd. XVII (1893) 939
6 Hd. XV (1893) 874
7 Nat. 6 July 1893
8 S.C.M. (1897) A. 4906 (Armstrong) and Nat. 23 April 1896
9 Hd. XII (1893) 1317-1318
10 S.C.M. (1897) A. 5978 (Farquharson)
11 Ibid. AA. 629, 169 and 659
12 Ibid. A. 5978 (Cundall)
13 Ibid. Appendix V

The credit for the initiation of the loans system was claimed by Robinson. He talked of "perilous and unnecessary peregrinations ... a loan system which has grown far beyond the original intention".[1] Once again, the Department had suffered from the results of its own success. While the Museums Committee recommended no major reforms in the loans system, commenting merely " there is room for improvement on the Science side",[2] Purdon Clarke, the Director, admitted to that Committee that "the enormous development" was "draining the Museum".[3] The development of the system in the new century included, as a major feature, the extension of loans to many kinds of schools other than Schools of Art. The seeds of the present most extensive and most successful service had been well sown.

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1 N.C. December 1892
2 S.C.M. (1897) li
3 Ibid. A. 4171

CHAPTER TEN

THE INSPECTORS

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a) Initial functions

i) The old regime

The Inspectors acted as the agents through which the central policy of the Department was exercised in the provincial Schools. For a time, under the old regime, the Head of the Metropolitan School of Design had also functioned as the Inspector of the provincial Schools. When Ambrose Poynter became the first full-time Inspector, in 1849, he was criticised in Cole's Journal of Design on several points. He maintained that the Schools should produce designers, not designs,[1] (a view later forced upon Cole), he "possessed no qualifications in design", he "caused trouble with both schools and manufacturers"[2] and he received additional income during his travels as a referee under the Municipal Buildings Act.[3] "The office of Inspector, as now performed ... is a farce. The public expect and require complete and methodic(sic) reports, precise facts and figures, and critical remarks on instruction and progress", said the Journal.[4] The Reports, it charged, were "mere generalities, ... stirring manufacturers' animosity".[5] Cole's suggestions for inspection were, like so many of his proposals at this stage, idealistic rather than practical. "A week is needed for each visit ... it is not by means of hurried visits (and) hasty snatches of attention that the system can be rightly and properly administered", he said. The needs for artistic knowledge, and skill and experience in teaching, were stressed.[6]

ii) Basic premises

When the Department was formed, Cole attempted to keep these points in mind. When the Consort suggested a candidate for appointment as Inspector, Cole insisted that "he must pass our examinations ... he should afford proof that he understands our system of teaching".[7] (The candidate, Severn, was not appointed.) The "administrative" function of the Inspector, as an official who was appointed to see that regulations were being observed, rather than to be concerned with the quality of the teaching, was soon prominent. "The Inspector is to check the local Committees, not remove their responsibility", believed Redgrave.[8] The appointment of Captain Owen, "to organise the

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1 J. of D. March 1849
2 Ibid. June 1850
3 Ibid. September 1850
4 Ibid. August 1850
5 Ibid. December 1850
6 Ibid. September 1850
7 MS letter Cole to Grey 2 December 1852
8 MS letter Redgrave to Cole 25 September 1852

Department's district and provincial Schools", in February 1853,[1] came, as has been recorded, after prolonged negotiations with the Education Department and the Treasury.[2] Perhaps, intentionally, the need for Parliamentary approval of this appointment was overlooked, and this freedom from parliamentary supervision of inspection by the Department was to be one of the ways in which its organisation differed from that of its sister Department. "There is no parliamentary authority for inspection in the Science and Art Department", it was stated at the very end of the period.[3]

Cole's belief that an Inspector must possess "skill and knowledge" of his subject, and teaching experience, lasted only a few months in office. While both he and Redgrave had, it could be argued, "knowledge", Cole certainly had no teaching experience, and it is most unlikely that Captain Owen had, either. Playfair, in Science, was qualified on both grounds. Either, or both, of these qualifications would, however, be possessed by few of the Department's Inspectors until the last decade of its existence.

iii) The personnel

While Cole, Redgrave, Playfair and Owen were the "official" Inspectors, there seems to have been a fairly free arrangement whereby members of the Department could assume inspection duties from time to time. J.C.Robinson visited schools in the North in 1853,[4] while Macleod and Burchett visited the West Country on separate occasions in 1854.[5] Cole paid three series of visits in 1852, four series in 1852, and five series in 1854. (While most of his Diary comments simply record the visits, he found Stoke and Hanley "in good order",[6] Manchester "old-fashioned",[7] Dublin "ill-arranged",[8] Nottingham "needing organisation"[9], and York "out of discipline".[10]) In 1856 he carried out seven series of visits: this was to be the "high point" of his own inspectorial duties. At the same time, Owen and Redgrave were carrying out visits to inspect Art arrangements,while Playfair performed the same function in the few Science Schools. The re-arrangement of duties between Cole and

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1 MS.M 1.141-143
2 Chapter II Section (e)
3 Hd. LXXV (1899) 1106 (Gorst)
4 MS.M 1.157-159
5 Ibid. 2.174 and 3.2
6 Cole MS Diary 4 March 1852
7 Ibid. 1 March 1853
8 Ibid. 22 September 1853
9 Ibid. 29 November 1854
10 Ibid. 8 December 1854

Playfair, which gave Cole the title of "Inspector General", did not mean that either of them gave up completely either his central administrative functions, or his work of inspection, as has been noted.[1] The friction with Jermyn Street, and the exclusion of Cole from any inspectorial functions there, has also been detailed.[2] The "week visit", which Cole had declared to be essential in 1850, was never at any time undertaken. Cole himself never spent more than two days in a locality, and he often recorded visits to two or three Schools in a day.

In January 1855 Captain Owen's resignation "in the urgent circumstances of the War" was accepted.[3] He was succeeded by H.A.Bowler, a former School of Design student, provincial Headmaster, and lecturer at the Central School. (Bowler was a landscape painter and exhibitor at the Royal Academy. He became Assistant Director for Art in 1881, and continued in the service of the Department until 1903. He was also a teacher of perspective at the Royal Academy Schools from 1861 to 1899). R.G.Wylde, who was a Senior Clerk in the Department, was at the same time appointed as a "sub-Inspector"[4] on a year's probation.[5] Bowler, with his experience as a teacher was, presumably, allowed to visit schools unaccompanied, but Cole went with Wylde on his first visits, to the West Country.[6] "Occasional" Inspectors, E. Harrison, A.R.A., and Eyre Crowe, A.R.A., were employed at the time of examinations.[7] Cole's own visits grew fewer with this additional aid. In 1857 he paid three series of visits, and in 1858 only one series. He continued, however, to visit the provinces from time to time. In 1868 he noted "with Redgrave to Wakefield. Two small rooms and bad landscapes being copied".[8] In 1869, when he visited Stoke, he noted tersely "no master there".[9]

iv) <u>The work of the Inspectors</u>

"If inspections are to be of value, they ought to be frequent and effective", Stanley, Cole's political chief, agreed.[10] A "constant system of inspection" had "made the organisation more efficient", the Department reported in 1857.[11] A

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1 Chapter II Section (b)(i)
2 Chapter VII Section (a)(i)
3 <u>MS.M</u> 3.60
4 Cole <u>MS</u> Diary 2 February 1856
5 <u>MS.M</u> 5.105
6 Cole <u>MS</u> Diary 4 to 11 March 1856
7 <u>D.S.A. 5th Report</u> 22
8 Cole <u>MS</u> Diary 27 April 1868
9 <u>Ibid.</u> 3 March 1869
10 <u>MS</u> letter Stanley to Cole 6 December 1856
11 <u>D.S.A. 4th Report</u> xxv

year later, "every provincial School of Art" had been visited "and the students' work examined".[1] "Strict adherence with (sic) the Department's course" was stressed by Bowler. The Art Journal, in reporting a visit to the Coventry School by "a Mr. Dowler" (sic), said that an examination has been set, by written papers, for "pupils of the School" and "of the public (elementary) schools"[2]; the fact that many students were unable to reach a satisfactory standard in such examinations was taken by Wylde to prove that "much copying" went on.[3]

The "administrative" function did not satisfy the Engineer, which called for "greater knowledge of Art ... and the class-room" as early as 1859.[4] There was a complaint that an "occasional Inspector" had caused "great concern" at one school by "awarding the medals to the wrong students": even when a promise was extracted from the Department that he would not be sent to the School in the following year, he was, in fact, sent again.[5] Even with his Art background, Bowler's qualifications were queried by the 1864 Committee, and he had to admit that he did not have "the figure certificate", and that he had "never been employed in a large establishment".[6]

b) New demands and partial solutions

i) Full-time Inspectors

The rapid growth in the numbers of Schools and classes, particularly in Science, after 1859, soon necessitated additional appointments. Captain Fowke was appointed as an additional Inspector in Science in 1857.[7] When Fowke took over Playfair's functions as an Inspector, Iselin was appointed as an additional "occasional" Inspector,[8] and Donnelly also assisted in this field. All these men could be seen to be fitted for their posts so far as knowledge of "content" was concerned. The appointments of Bartley and E.P.Bartlett could hardly be so regarded. They possessed Department certificates,[9] but their experience had been purely administrative. Bartlett's promotion was particularly opposed by Donnelly,[10] and Cole believed that he would have "many competitors",[11] but he was appointed from the ranks of the clerks.[12] Responsibility for classes in Ireland

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1 D.S.A. 5th Report 40
2 Art J. December 1856
3 D.S.A. 4th Report 187
4 Engr. 23 December 1859
5 S.C.S.A. AA. 631 and 637 (Gregory of Lambeth)
6 Ibid. AA. 4174 and 4120
7 MS.M 7.208
8 Ibid. 14.52
9 Ibid. 11.2
10 Cole MS Diary 20 February 1873
11 Ibid. 6 January 1873
12 D.S.A. 21st Report 45

was from 1867 the special concern of F.J.Sidney, until he became Secretary of the Dublin College of Science in 1876. The following year,Abney, who in addition to his high science qualifications,had organised and taught in the Chatham School of Photography, became a full-time Inspector.

There is no doubt that the Inspectors were kept occupied. In 1866, Sidney visited 27 Schools in April alone.[1] In 1867, Iselin went to 32 towns in North West England and visited 55 Schools in one tour.[2] The following year, he visited 101 classes in all, 22 during examinations, and Sidney "inspected" 18 examinations in 12 schools in one month.[3] Time spent in travelling perforce reduced the amount of time available for inspection. "Too hurried inspection" was commented upon by Sidney in 1866.[4] While the day could be spent in travelling, the fact that classes were held almost exclusively in the evenings cannot have helped.[5] Against this must be seen the fact that the Schools were, on the whole, in session for only eight months of the year. However, there were strong arguments for the appointment of more Inspectors who would be regionally based, especially since so much of the Inspectors' time had to be spent in checking registers and other paper work.

ii) <u>The introduction of Engineer officers</u>

In 1867, Cole discussed with Donnelly "the use of Royal Engineers as Science Inspectors".[6] (Officers of the Royal Artillery were also considered at one stage,[7] but that Corps was not finally involved.) The use for such duties of officers of the Corps who had received a basic "scientific" training,[8] presented many advantages. "The service of a staff of qualified government officers ... for merely temporary action" was seen as "cumbersome and extravagant". To use the R.E.'s would mean that "a qualified body of men" could be obtained "at a comparatively slight cost ... without interfering with their duties". The officers' chief function would be "to prevent mistakes in examinations",but it was also stated that they would "consult and advise the Local Committees" on various, unspecified, details.[9] In other words, they were

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1 <u>D.S.A. 13th Report</u> 64
2 <u>D.S.A. 14th Report</u> 56-58
3 <u>Ibid.</u> 58-60
4 <u>D.S.A. 13th Report</u> 63
5 <u>D.S.A. 21st Report</u> 46
6 Cole <u>MS</u> Diary 27 December 1867
7 <u>P.M.</u> B 2 Sec. 158 (December 1867)
8 Chapter XVII Section (c)
9 <u>D.S.A. 16th Report</u> ix

being appointed primarily to supervise examinations, and once more the checking on the "observance of the regulations" was seen as the main purpose of inspection.

"The use of the Royal Engineers is the cheapest mode of obtaining science inspection ... you could hardly find it at present except in that particular body", Cole argued.[1] Treasury approval was obtained,[2] and in the first year of the scheme the officers who volunteered for the duty visited about 500 examinations. They were also employed in "preliminary inspections". "Nearly the whole of the schools ... have been inspected and reported upon", it was stated. "They watch instruction, check cram, and bring the Department into intimate relations with, and knowledge of, classes".[3] The officers were paid a guinea a day, and the average cost of a visit was 36/-.[4]

ii) <u>The "exigencies" of the service</u>

One great difficulty was that the headquarters of the Engineers were in areas where the Department was least active. Thus, Kent, with the important bases of Dover and Chatham, had only 17 Science Schools or classes in the early days of the scheme. Conversely, the Midlands and North, where classes were found in the greatest numbers, had only five Engineer Inspectors.[5] The Commanding Officers of Districts "distributed ... the work ...as the exigencies of the service permitted",[6] but to overcome the distribution difficulty, the Department used the services of officers on leave. "The ease and the rapidity with which each officer grasped the principle of the organisation of classes and comprehended the duties entrusted to him" drew favourable comment. The scheme was extended to include the inspection of Art classes from 1869.[7]

"Checking on red-tape", with occasional "meetings with Local Committees if they find a screw loose", was Cole's view of the Engineers' function. The system, he said, had been matured by Donnelly "as a check on regulations".[8] To the charge that they did not "touch upon the greatest evil, the want of system"[9], Abney admitted that they were "purely administrative unless scientific knowledge is needed".[10] In 1883, this administrative function was stressed in the Report of that year.[11]

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1 <u>S.C.S.I.</u> AA. 326-327
2 <u>Ed. 23.412</u> (10 July 1868)
3 <u>D.S.A. 17th Report</u> x and 49
4 <u>D.S.A. 18th Report</u> xi, 58, 84-85
5 <u>Ibid.</u> 78
6 <u>Ed. 23.412</u> (9 May 1868 Macleod to Treasury)
7 <u>D.S.A. 18th Report</u> 78
8 <u>R.C.S.I.</u> AA. 7 and 5973
9 <u>R.C.T.I.</u> A. 511 (Curzon)
10 <u>Ibid.</u> A. 3079
11 <u>D.S.A. 30th Report</u> xli

In 1871-1872, the Engineers visited 538 schools and 704 examinations, while the figures for the full-time Inspectors were 152 schools and 32 examinations. There were thus "fewer irregularities", it was reported.[1] With their aid, every science class could be "inspected" in alternate years.[2] Details published in Annual Reports until 1881 show that from small beginnings, the numbers of officers involved annually rose to a maximum of 69 in 1875-1876[3], with an average for the period of fifty officers a year. There were difficulties and drawbacks, however. "The use of military officers withdraws a class of appointment which should be the reward of a teacher's success", was a complaint voiced at a meeting of the Society of Arts.[4] The duties of inspection were complicated by the demands of the service. Of a total of 245 officers who served in the period to 1882, 92, or 37% only, carried out the duties for more than one year.[5] Of the 153 who served for two years or longer, only 111 were actually stationed in the same area for two or more consecutive years. Of these, only 15 served for five years or longer in the same area.[6] It must, therefore, have been impossible to ensure any familiarity with a school and its conditions, through continuity of inspecting personnel. (A suggestion that "histories" of Schools should be compiled, to be given to each Inspector before his visit,[7] was one means by which it was hoped to overcome this drawback.) The Engineers continued to be used almost to the end of the period, particularly in "practical" subjects, but their services became of less importance as a more liberal view of the Inspectors' functions developed.

c) The "administrative function" under attack

i) The Department's view of functions

The view of the duties of the Royal Engineer officers epitomises the attitude of the officials of the Department, for much of its existence, on the basic functions of the Inspectors. From the first appointments of full-time Inspectors, they were seen as persons concerned with administration and organisation. They were primarily employed to check that regulations were being observed, whether in the conduct of examinations, or in the keeping of records. This attitude was reinforced, as the system developed, by the belief that the examinations system provided the real check on the success of "method". It was

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1 D.S.A. 19th Report x
2 R.C.T.I. A. 3080 (Abney)
3 Table LIII
4 Art J. 1884 78
5 Table LIV
6 Table LV
7 D.S.A. 20th Report 41 (Wylde)

further complicated, from this basis, by the belief that "inspection" of instruction, if attempted at all, involved an examination of content rather that a consideration of the general approach. The Examiners, it was argued, were "specialists" in their particular areas: if inspection of "content" were to be made fully operative, it would be necessary to appoint "specialists" to work in the field in all the subjects of the Directory.

This "administrative" stress is shown in the fact that Cole could quite seriously consider the appointment of Deverell as an Inspector, to remove him from Headquarters[1], and that he could later suggest an exchange of duties between Macleod and Donnelly.[2] It is only on this basis that one can understand the appointments of Bartley and Bartlett. His son-in-law had "many certificates", Cole told the Samuelson Committee, but he was "a lay administrator" who saw "that points are right". He had "no professional knowledge" and arranged "with professional gentlemen about examinations".[3] Bowler's account of his duties, as he saw them in 1864, was that they included "taking charge of the examinations in local Schools, assisting Mr. Redgrave with central examinations, and sharing in correspondence on Art matters". He agreed that "most disputes arise on the interpretation of rules".[4] Iselin defined his duties, in 1868, as "visiting the schools during examinations ... and inspecting them for the rest of the year"[5], and the order is significant. The chief purpose of inspection in the Elementary Schools was seen to be "a safeguard against cheating". "Actual practice" was not examined: once again, the fact that papers were "sent to South Kensington" was seen as the real test.[6]

Further proof of the "administrative" nature of the inspection is given by the fact that although Inspectors were designated as "Inspectors of Science" or "Inspectors of Art", they visited Schools of both kinds.[7] When Iselin was appointed, the Art Journal, in noting that he was a mathematician, said that "the world of Art" was "profoundly ignorant of him"[8], which would suggest that it was quite expected that he would visit both kinds of Schools. "An Art Inspector visits one year, and a Science Inspector the next", because, said Abney, "any other system would lead to unnecessary duplication of visits".[9]

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1 Chapter I Section (d)
2 Chapter III Section (a)(iv)
3 S.C.S.I. A. 136
4 S.C.S.A. AA. 4073 and 4085
5 S.C.S.I. A. 1336
6 R.C.T.I. AA. 3151 and 3367 (Armstrong)
7 D.S.A. 30th Report xli
8 Art J. November 1862
9 R.C.T.I. A. 3089

J.C. Buckmaster, as "Organising Master" was restricted to advice on organisation of schools, not their methods of teaching.[1]

ii) The views of the "inspected".

Complaints that the Inspectors were of little real assistance in advising teachers were made by several witnesses before Committees and Commissions. "Great importance is attached to the May examinations, but none to the visit of the Inspector;" it was said.[2] Lack of knowledge of the subject was "the cause of ludicrous remarks which damage the whole visit".[3] "Vivas by Science Inspectors are the only answers to cram", it was believed,[4] but "the present inspection of schools is a mere farce ... there are no suggestions for Local Committees ... the Inspector knows nothing of the subject in many cases;" it was alleged.[5] One witness went so far as to say that "the majority of the schools" were "not touched by inspection at all".[6] The Scientific Instruction Commission said that the limited number of full-time Inspectors meant that "supervision to influence methods" was inadequate.[7] The Technical Instruction Commission agreed with its recommendations for "more close and frequent inspection", but significantly added the words "of instruction".[8]

iii) Increased concern with "method".

Science Form 337 (1870) "to be used by Inspectors of Science Schools", required the Inspector's opinion on the quality of the instruction given in a School.[9] (It is somewhat difficult to see how reasoned judgments could be given by Inspectors who were themselves unfamiliar with the problems of teaching, but such opinions were, in fact, given by Engineer officers, as some of the evidence in the Goffin case reveals.[10]) Details of Inspectors' Reports given in the Minutes of the Middlesbrough Mechanics' Institute show an increasing concern with "method": while the early Reports[11] concentrated on registers, fees, and accommodation, one of the last Reports asked the Committee to "urge on the master the necessity of adopting sounder methods of instruction", and went into some detail on these, stressing the need for individual development and the importance of stimulation.[12]

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1 S.C.S.I. AA.8187, 8205-8216
2 Ibid. A.7711 (Macadam)
3 R.C.S.I. A.6182 (Sales)
4 Ibid. A.2250 (Shore)
5 Ibid. AA.5898 and 5901 (Sales)
6 R.C.T.I. A.508 (Curzon)
7 R.C.S.I. xxv and xxviii
8 R.C.T.I. 518 and 537
9 R.C.S.I. Appendix X
10 Chapter XI Section (h)(ii)
11 Middlesbrough Mechanics' Institute MS Minutes 18 March 1864, 31 July 1874, 21 January 1879, 29 December 1884, 10 February 1885
12 Ibid. 30 November 1886

"Time studies to develop ready skill" in Art were recommended in 1864.[1] Summer courses were "bringing improvements in the class-room" in 1870,[2] and the role of the Inspectors as "agents of cross fertilisation" was also noted in that year, when it was said that they had an important part to play "by bringing ideas from other localities".[3] Visits to every "Department" laboratory in the country were undertaken,[4] and cases were quoted, "to encourage the others", where recognition was withdrawn until facilities were improved.[5] The annual Reports of the Inspectors, which in the earlier years concentrated on references to cases where regulations had been infringed, and the dire consequences to teachers,[6] while they showed a relaxation in this respect, offered little comment on "method", however, for many years.

While Iselin could "observe teaching, question and make a report", he stressed that his first duty was to "see that the regulations are complied with", and he said that he could "visit three to four examinations in an evening".[7] Abney told the Technical Instruction Commission that his duties were "primarily administrative", and made particular reference to "the checking of registers". He said that where there was "the least shakiness" frequent inspection took place. He agreed that the Inspector was looked upon "more as a police officer", and admitted that he liked "to take a class unawares". "Every science teacher should live in the expectation that the Inspector may look in upon him at any moment", he said.[8] (The Local Committee was warned of impending visits, Iselin had said some years before.[9]) Before that Commission, Iselin repeated his view of his functions: the "Inspector's principal duty", he said, "is to see that the rules are carried out".[10]

iv) Impediments to change

The temporary expedient of using "eminent men of science" in large centres, "so long as over expense is avoided"[11], does not appear to have been greatly used.[12] The belief was still expressed that the written examinations

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1 D.S.A. 11th Report 58-59 (Bowler)
2 D.S.A. 17th Report 57 (Iselin)
3 Ibid. 57 (Iselin)
4 D.S.A. 32nd Report 33-34 (Abney)
5 D.S.A. 34th Report 51 (C.A.Buckmaster)
6 e.g. D.S.A. 14th Report 56-58 (Iselin), D.S.A. 16th Report 67 (Iselin), D.S.A. 20th Report 42 (Wylde), D.S.A. 21st Report 168-169 and D.S.A. Report 386 (Bowler)
7 R.C.S.I. AA. 5898 and 5901
8 R.C.T.I. AA. 3072, 3082, 3088 and 3092
9 R.C.S.I. A. 5898
10 R.C.T.I. A. 3099
11 D.S.A. 18th Report 35
12 Sheridan Lea of Cambridge visited 30 Schools to 'inspect' Biology in 1884. (D.S.A. 31st Report 78)

were the best test of instruction. "First rate men" were needed, otherwise "you will need an Inspector to inspect the Inspectors", it was argued.[1] The difficulty of "inspecting" the whole range of Directory subjects was pointed out. "Had I not been addicted (sic) to science, I do not see how I could have technically inspected classes", said Abney, and he admitted that there were some subjects in which he was "incapable of examining". He believed, no doubt with truth, that teachers had little respect for an Inspector who did not possess technical knowledge, but he argued that a "system of experts in every subject examining the schools in situ would incur enormous expense".[2] An H.M.I. warned that "specialist Inspectors would tend to magnify their own offices".[3]

More important than these objections was the basic difficulty of finding qualified scientists and artists who could undertake the work, particularly in the former field. A suggestion that the H.M.I.s of the Education Department could render valuable assistance was scotched by Cole, with the remark that it was "most unlikely that one would find competent examiners in Science" in their ranks,[4] although Donnelly believed that they might render useful service.[5] Sandford too, while prepared to consider the suggestion, pointed out that few of the H.M.I.s "had the scientific education which would make them competent to examine".[6] The British Association Committee on the Inspection of Science Teaching in Elementary Schools was more forthright. It said bluntly that H.M.I.s were not competent to inspect science teaching, "because they are appointed for high scholarship",[7] and another of the Association's Committees, on the teaching of Science in Elementary Schools, went further, and demanded the "appointment of natural scientists as H.M.I.s."[8]

Officials of the Department were also concerned about the costs if additional Inspectors were appointed. "There would be a great outcry" if expenses rose, said Donnelly.[9] Qualified men would demand more than the £100-150 suggested as "fees for evening work", believed Abney, and his fear of "enormous expense" has been quoted.[10] On this point, however, the annual

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1 R.C.T.I. A. 3136 (Iselin)
2 Ibid. AA. 3074, 3076, 3091
3 Ibid. A. 3685 (Fitch)
4 R.C.S.I. A. 6059
5 Ibid. A. 6466
6 R.C.T.I. AA. 8360-8362, 8385
7 Br. Assn. Report 1880
8 Br. Assn. Report 1881
9 R.C.S.I. A.6469
10 R.C.T.I. AA. 3137 and 3091

Reports show that the costs of "inspection and examination" rose from £8,870 in 1870-1871 to £21,312 in 1883-1884. This sum would have paid for a great deal of "full-time inspection", always assuming that the qualified men would have been available.

v) Temporary expedients

In 1882, C.A. Buckmaster was appointed as the successor to Bartlett on the latter's death.[1] Four years later, G.R. Redgrave, who had served as a young man in the South Kensington Drawing Office[2] and had then worked as a chemist for Cole's Sewage Company, was appointed as an additional Inspector. Both men were possessors of Science degrees, and both had teaching experience.[3] (They also followed a tradition in being related to officials. Redgrave was Richard Redgrave's son, and Buckmaster was the son of the "Organising Officer" and the brother of a future Lord Chancellor). In the year of Redgrave's appointment, a number of sub-Inspectors were appointed to work in the Elementary Schools. (They seem in the main to have been retired officers: of 85 appointed in the first list, 42 bore a military or a naval title).[4] Their chief function appears to have been the supervision of examinations. The "awards" to schools still depended on examination of the completed works at South Kensington "by the technical examiners".[5]

Despite this aid, Inspectors were still very fully occupied. While the task of checking registers was lightened in the few Organised Science Schools of the time, when one register was used for the whole school, "much mechanical work" was deplored by Buckmaster, who said that this chore might take an hour or more, and he quoted "36 registers in a Gloucester School, and 61 at Lincoln".[6] In one year, the same Inspector travelled "from Penzance to Aberdeen", and covered 9,683 miles to visit 229 institutions.[7]

d) The achievement of "full inspection"

i) Factors in the change-over

The implementation of a more "modern" inspection system depended upon two factors, a better supply of qualified men, and the lessening of the importance attached to the written examinations as the prime test of the success of teaching

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1 P.M. XXI sec. 152
2 MS.M 14.51 (December 1861)
3 R.C.S.E. A.10150. (Buckmaster earned £13 on results at Llandovery College in 1881. D.S.A. 28th Report 319)
4 D.S.A. 33rd Report xiii
5 Hd. CCCXV (1887) 1227
6 D.S.A. 36th Report 8
7 D.S.A. 32nd Report 35

methods. "Qualified men are now much more available", the Technical Instruction Commission were told[1]: the Department itself must be given partial credit for the better supply of qualified scientists. The reform of the Department's system of encouragement and control, initiated by Acland and carried through by his successors in office, already detailed,[2] made it possible to introduce a system which placed more importance on the advisory function of the Inspector. Donnelly's disappointment at the way in which Acland set about choosing the Inspectors has been recorded.[3] Acland himself was well pleased with the results of his travels with Abney. He recorded in his Diary that he had "selected what I hope will be a really good set of men as permanent Inspectors".[4]

The Treasury sanctioned the appointment of thirteen additional full-time Inspectors to bring the total to seventeen, "to improve the supervision of Science instruction, and co-operation with local authorities". The country was divided into districts, each with an Inspector in charge, and a number of sub-Inspectors, whose main duties were to "inspect" Art and Manual Instruction in the Elementary schools, working under him. The advisory role of the Inspectors, particularly with regard to schemes of laboratory work, was stressed.[5] The object, Acland told the House, was to "add a resident Inspector, somewhat more learned and trained in educational matters and methods." The "paperwork" element would be lessened, and an element of inspection would be introduced into the examinations, he said, but he did not think that it would be possible to "jump into the system of pure inspection at once".[6] The new Inspectors, the "twelve Apostles", included two officials of County Technical Instruction Committees, five University lecturers and demonstrators, two former "occasional" Inspectors, a Science School Headmaster, and a former Captain of Engineers.[7] (One of the lecturers had begun his own further education at a Mechanics' Institute and had gone on from there to the Normal School of Science.)[8] Members of Parliament hoped that "due weight would be given to the claims of teachers",[9] and when a further appointment was made in 1897, it went to the Head of a School

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1 R.C.T.I. A. 3612 (Oakley)
2 Chapter V Section (c)(vi)
3 Chapter V Section (f)
4 Armytage Four Hundred Years of English Education 177
5 D.S.A. 41st Report lxv
6 Hd. XXIX (1894) 216
7 Engr. 26 January 1894
8 D.N.B. (A.E.N. Tutton)
9 Hd. XLII (1896) 1289 (Yoxall), LI (1897) 1556-1557 (Yoxall and Grey)

of Art.[1] Many of the former sub-Inspectors, who had been retained on a yearly contract, were no longer employed,[2] and this was seen as a "lessening of the charge to the public".[3]

ii) Methods of approach

The Reports of the Inspectors, published in the Annual Reports, reveal much more concern with "method". Details of the numbers of visits paid would suggest that individuals still bore a heavy load, but the total mileage and travelling time must have been much reduced.[4] By 1896, 2,257 of the 2,443 institutions receiving aid could be visited in one year.[5] The Department furnished Local Authorities with details from Inspectors' Reports on request: extracts from over 700 reports were so provided in 1897, and this had "results of the greatest value ... if only in the reduction of correspondence".[6]

The wider development of the system did not meet with universal approval. The complaint that Inspectors would have "varying standards of benevolence", which could affect teachers' remuneration[7], was met by arrangements designed to develop uniformity of standard: Inspectors visited schools together, compared individual reports, and attended annual conferences.[8] While the elementary school teachers who taught in evening classes were "habituated to the presence of an Inspector", many other teachers were "disinclined to teach in their presence".[9] Adult students were "loth to discuss", and there was often "only a 20% attendance ... when they knew the Inspectors were coming".[10] (This would suggest that, despite Abney's views on the value of "surprise", warning of visits was given).

iii) The last years

"The impossibility of complete inspection" was now "just possible", Abney believed in 1896.[11] (Donnelly, defending to the last his cherished system, argued that examinations would continue to test efficiency, since Inspectors could not be expert in all spheres.[12]) With the abandonment of payments on results, the system of inspection attained its full importance, with an increase

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1 D.S.A.O.B. 2 December 1897
2 Hd. XXXIII (1895) 14-15, XXXIV (1895) 1535 and XLII (1897) 1288
3 Hd. XXXVI (1896) 783 (Gorst)
4 In 1894-95, one Inspector visited 272 Schools, a second visited 189, and a third "inspected" 200 classes in 85 schools.
5 D.S.A. 44th Report 44
6 D.S.A. 45th Report 11 (Abney)
7 Engg. 1 February 1895
8 R.C.S.E. A. 1325 (Abney)
9 D.S.A. 41st Report lxv (C.A.Buckmaster)
10 Ibid. lxvii (Hoffert)
11 R.C.S.E. AA. 12020-12021
12 Ibid. A. 1123

in commitments. Some of the load was reduced when the responsibility for Drawing was transferred to the Education Department, and some of the sub-Inspectors were moved to that Department.[1] The use of H.M.I.s to inspect the "literary" subjects in the Organised Science Schools[2] resulted in the "rehabilitation" of these subjects.[3]

The appointment of additional Inspectors was held up by the delay in the legislation for the proper organisation of the Secondary system[4], and, by 1898, had become "an urgent necessity".[5] Despite thisshortage, the change-over to the system of payments on capitation and inspection "caused less inconvenience than was expected".[6] It was reported that there was "now a more intimate connection between the Inspectors and the teachers" and that "great steps" had been taken "to eradicate the faulty".[7] The organisation of annual conferences of science teachers, with lectures, demonstrations and discussions, did not, however, develop until after the end of the Department's existence.[8]

When a long-serving Inspector retired, he paid a tribute to the efforts of the teachers, and said that what they most valued in an Inspector was "practical, technical knowledge".[9] The Inspector as an "administrator" was retained by the Department for so long because of the continued faith in the examination as the test of success, coupled with a lack of concern with "method" so long as schemes of teacher training remained rudimentary. There is little doubt that the concern with individual classes or Departments,rather than with institutions as a whole, which continued to exist for a long period into this century, had its origins in this "fragmented" approach. It can, however, be argued that in the last years of its existence, the Department developed a system of inspection which was more designed to help the teachers than to "police" them.

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1 D.S.A. 45th Report 7
2 R.C.S.E. A. 11976 (Abney) and Rules for Organised Science Schools [P.P. (1895) LXXVIII]
3 D.S.A. 44th Report 47
4 Hd. XLII (1896) 1291 (Gorst)
5 D.S.A. 46th Report 9
6 D.S.A. 45th Report 7 (C.A. Buckmaster)
7 D.S.A. 46th Report 9 (G.R. Redgrave)
8 Nat. 17 January 1901
9 D.S.A. 44th Report 47 (Barwell)

CHAPTER ELEVEN

THE TEACHERS

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A) The Art Teachers

a) Training and supply in the first years

i) The purpose of the Central School

In 1842, Ewart brought forward a motion that the School of Design should be "formed into a Normal School", for the instruction of teachers of design for the provincial Schools. (A "Normal School" had been recommended by the 1836 Committee). The Government was not prepared to make this the sole role of the School, said W.E.Gladstone, Vice President of the Board of Trade (and Ewart's god-son), but he told the House that, in fact, a "probationary training class" had been formed there "for persons of good character". One master had already qualified and had "been sent forth to a provincial school".[1] The slow growth of provincial Schools before 1852[2] meant that there was little demand for teachers. Eventually "all were instructed so that they could become teachers or ornamental designers ... and the partiality of the Director was sorely tried".[3] "There was no plan of training masters at all", said Redgrave later.[4]

From the foundation of the Department of Practical Art, it was intended that the central institution should become primarily a training school for teachers, who would act as the local agents in the "elevation of taste" and in the production of designers. This function was frequently stated by the officials of the Department.[5] The reorganisation as a "Normal Training School" was announced while the School was still at Somerset House:[6] there were 25 "masters-in-training" when the move to Marlborough House took place.[7] Even the Art Journal believed that the plan was "judicious".[8] "Much will depend on the masters sent down", Playfair believed.[9] The title of National Art Training School was adopted at some point during those early years. Cole consistently referred to it as "The Normal School".[10]

ii) Sources of students and means of entry

The only figures of regional origins of students are those given in the earliest years. In 1854, there were twice as many students from London as from

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1 Hd. LXV (1842) 143-149
2 Table XVII
3 Bartley op. cit. 488-491
4 S.C.S.A. A.44
5 "The training of teachers is the first concern" (D.S.A. 2nd Report xxxiii)
"(It) is essentially a place for training teachers" (S.C.S.A. A. 29 Cole)
"(It) was established to teach those ... who will disseminate the principles" (Burchett Address of December 1857)
6 D.S.A. 1st Report xli
7 D.S.A. 2nd Report xxxiii
8 Art J. August 1852
9 MS letter Playfair to Cole 6 July 1852
10 Cole MS Diary 24 July 1853 et seq.

the provinces: after that year, the position was reversed.[1] Students did not always return to the Schools where they had studied as "pupil-teachers" and qualified to enter the Central School.[2] The growth in the numbers of applicants meant that it was possible in 1856 to impose an entrance examination which involved a paper in "General Knowledge",[3] Reading, Writing, and "one book of Euclid".[4] Arithmetic was later added, despite the objections of Lord Stanley.[5] It was thus hoped to form "a class of educated Art teachers".[6] Women were admitted to the courses from 1857[7], and continued from that time to gain certificates in ever increasing numbers.[8]

Many students appear to have entered the course with the intention that teaching should be, at best, only a secondary occupation. "The foundation of the Government Schools of Design (sic) saved many newly raised artists from disaster in making them teachers", argued a critic thirty years later.[9] "My original intention was to be an artist", Sparkes admitted.[10] A "small number" of the students became painters, Cole agreed, but he could see no objections "if they could do something better than teaching", and he felt that their success would encourage others, who would eventually teach, to enter the School.[11] "Teachers should be artists, and vice versa", one Professor believed,[12] but Sparkes said that he knew "of no man who is both a good teacher and a good artist".[13] Successive Directors were concerned about their "profession as artists", as has been recorded, so that students could perhaps hardly be blamed if they adopted the same attitude.

iii) The course of training

Since the great object of the provincial Schools was "basic" teaching, it was argued that "the middle-class subjects of figure drawing and painting could wait", and there was in the early days a concentration on freehand drawing, model drawing and practical geometry.[14] (These were the main strengths of the

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1 Table XXVIII
2 Table XXIX
3 MS letter Playfair to Cole 16 November 1856
4 Burchett Address of 1857
5 MS letter Stanley to Cole 6 July 1856
6 D.S.A. 4th Report 55
7 MS letter Northcote to Cole 15 March 1857 and Cole MS Diary 23 January 1857
8 Tables XXX and XXXI
9 N.A.A.A. 1888 66 (Holman Hunt)
10 S.C.S.A. AA. 781 and 902
11 R.C.S.I. A. 5979
12 Ibid. A. 2082 (Legros)
13 S.C.S.A. A. 1407
14 D.S.A. 2nd Report 119

Headmaster, Burchett). At the outset, there was an emphasis on the teaching element. "One of the best masters in the Department", J.C.Robinson, obtained the post when Cole recommended "the appointment of an experienced person to teach the teachers how to teach".[1] When Robinson moved to the Museum, his place was taken by C.H. Swinstead, who had himself been a pupil. Demonstration lessons to children, followed by "post mortems" and blackboard expositions, given at first,[2] were succeeded by a system in which students "taught" one another. "The language of eight year olds proved difficult to mimic",[3] and it was decided to return to a plan which had been used at the old School of Design[4], whereby students taught in "parochial schools", and, in addition, they would now teach in district Schools of Art.[5] Students received additional pay while teaching in these Schools. There was a monthly progress report, method lectures were given, and the student was "taught to know why he does what he does".[6] Swinstead then acted as "Inspector of Practical Teaching".[7]

The suggestion of a "diploma" for teachers who qualified, made by the Consort's friend, Harding,[8] was adopted: the certificate was made a condition of financial support of teachers appointed under the new regulations. The students were examined in Ornament, Model Drawing, "Colour, Geometry and Perspective",[9] and initially, had to "teach a class in the presence of others".[10] In 1857, the standard of examination was raised, and the title of "Third Grade" certificate was bestowed.[11] Despite the entrance examination, and the hope of "raising a class of educated Art teachers", the course never appears to have gone beyond instruction in Art, although the "middle-class" subjects of figure drawing, painting and modelling were later introduced.[12] This led to criticisms that "over concentration on Art leads to artistic crotchets in the teachers".[13]

One problem which was never fully resolved was the question of instruction in technical processes. The course included "Technical Instruction to allow the teacher to become immediately useful to the localities", in 1856.[14]

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1 MS.M 1.104
2 Obituary of Swinstead (S. and A. May 1890)
3 D.S.A. 2nd Report xviii
4 Bartley op. cit. 489
5 D.S.A. 2nd Report 117
6 Burchett Address of 1857
7 D.S.A. 3rd Report 86
8 MS letter Grey to Cole 13 March 1854 and Cole MS Diary 8 October 1852
9 D.S.A. 2nd Report 142
10 Burchett Address of 1857
11 D.S.A. 4th Report 56
12 Brown op. cit. 12-13
13 Engr. 24 December 1858
14 D.S.A. 3rd Report xi and Bartley op.cit. 491

The following year, Burchett looked forward to the time "when local Schools take up the manufactures of the localities, thus enabling them to become artistic workshops".[1] Newly appointed masters were told thatthey must become familiar with local manufactures,[2] but the general assumption appears to have been that there were basic "principles of design" which,once learned, could be applied to any particular industry. This was to lead to particular concern in later years. Teachers "have no knowledge of trades;"[3] "... they say they cannot learn technicalities;"[4] it was charged. The development of the City and Guilds movement, and greater attention to "applied Art" in the National Competitions, reduced the criticisms, but the "applications" must have been developed by the teachers "on the job".

iv) The length of courses

The "experiment of the Art Training School" was "cautious", until the demand for teachers increased, and "conditions were not especially favourable at the time", Cole later said.[5] The rapid growth of provincial Schools[6] led the Athenaeum to agree with the Department[7] that "demand far exceeds supply": seventeen Schools "awaited masters" in 1854.[8] The length of the course was, on average,just over six months in the first years; there was a steady increase to 1865 to the point when the last annual reference to its length would suggest that four years was an accepted period of time.[10]

These are average figures. In the earliest days, some students attended for up to nine years.[11] The Headmaster had instructions to "dismiss students suspected of loitering,"[12] and the Board declined to renew the grants of students,whose awards were terminated,in 1860 on the grounds that they had been "very long in taking their certificates".[13] The course was limited to four years, by regulation, in 1888,[14] but Masters could return to take further certificates, and frequently did so.[15] A longer course, leading up to all six

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1 Burchett Address of 1857
2 S.C.S.A. A. 555 (Redgrave)
3 Art J. July 1884
4 S. and A. March 1889
5 R.C.S.I. AA. 6020 and 6022
6 Table XVII
7 D.S.A. 1st Report lviii
8 Ath. 8 April 1854
9 D.S.A. 1st Report lviii
10 Nine Months (D.S.A. 3rd Report 32 and 51) Two years four months (D.S.A. 7th Report 62) Two years eleven months (D.S.A. 9th Report 38) Three years one month (D.S.A. 10th Report 54) Three years nine months (D.S.A. 11th Report 60) Four years (D.S.A. 12th Report 86)
11 S.C.S.A. Appendix 258-259
12 Ibid. AA. 4426 and 4434 (Cole)
13 MS.M 12.70
14 D.S.A. 36th Report xxvi
15 D.S.A. 4th Report 55

certificates, was really needed, Cole believed, but after the early years demand was "pausing a little";[1] and students were gaining anything from three to five certificates compared with the single certificate students had taken in the early days.[2]

v) The value of the course

His course has "involved a loss of time" but he was "a better teacher as a result", J.C.Sparkes admitted. He added, however, that "the only new thing I learned was Mechanical Drawing ... and I did not touch a brush in the first two years of the course".[3] A statement signed by all the current students, that the Museum and Art Library were of less use than they should be, was produced by Sparkes to the 1864 Committee;[4] in refutation, the Department produced high figures of attendance and hours per week spent at the School.[5] Frederick Brown, Slade Professor from 1893 to 1917, had an unhappy time because of "the mechanical methods of teaching", but he "endured the course for eight years".[6] Sir Edward Lutyens, P.R.A., was a student for two years, and "left without a certificate", after what appears to have been an unpleasant time for him.[7]

Members of Local Committees appear to have been satisfied with the products of the School.[8] It is notable that there was no repetition of the 1845 "rebellion", although two of the "mutineers", Burchett and Herman, Headmaster and Registrar respectively, do not appear to have made very great changes in the courses which were followed.

vi) Local training

A limited scheme of "teachers' assistants" had been in existence in the old Schools of Design.[9] The "pupil teacher scheme of the Committee of Council" was officially adopted by the Department in 1854. The pupil teachers were limited to four per school, they were in theory to serve not more than two years, and were to be paid £10 a year, with a share of the fees from elementary instruction.[10] Although the "choice of name" was called "unfortunate",[11] the

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1 R.C.S.I. A. 6075
2 S.C.S.A. A.29
3 Ibid. AA. 895, 902, 911 and 1136
4 Ibid. A. 1135
5 Ibid. Appendix 307
6 D.N.B.
7 D.N.B.
8 S.C.S.A. A. 2529 (Keith of Norwich) A. 4311 (Primrose of Edinburgh)
R.C.T.I. A. 66 (Wedgwood of the Potteries)
9 Bartley op. cit. 489
10 D.S.A. 2nd Report xix
11 Engr. 8 January 1858

scheme developed well. In fact, most of the pupil-teachers served for only a year, while many exceeded the two year limit by a considerable margin.[1] Many of the "apprentices" went on to the Central School and qualified as masters.

By 1863 it was decided to extend the scheme of training for Art Teachers Certificates to the local Schools of Art. Local masters were encouraged by a payment of £15 on each student who qualified. At the same time, the name of "pupil teacher" was exchanged for "Local Scholar". These changes had the dual purpose of reducing costs in the Central School, which would be "reserved for those of superior abilities",[2] and raising standards in the local Schools. There would, it was said, be no further payments to assist students to take the "first" certificate in London.[3] "We have quite done away with training for the first certificate at the Central School", Cole claimed.[4] "It was a provisional certificate anyway", Redgrave added.[5] There were seven such local awards in the first year of the scheme, but the "first" certificate could still be obtained at the Central School, although the provincial Schools consistently produced more "certificated teachers" from that point.[6]

vii) The position in 1863

The "limited means of the entrants" made it impossible to conduct the Central School as a completely self-supporting body,[7] although, as has been recorded, the "private" students paid fees which helped in some measure. The masters cost "£200 to £300 each to train, and then go and get a living and make their own arrangements with local Committees", said Cole.[8] (Lowe was very critical of Sparkes before the 1864 Committee, saying that he had expected "a free education" and was "prepared to give nothing in return".[9]) From the outset, as has been seen, the Department stressed that "success would depend on efficiency",[10] and this of course, basically depended upon the masters' efforts and qualifications. The remuneration, based on certificates payments and a share of fees, was meant to ensure this. In view of later controversies, it is of interest to note that "the government" would "appoint qualified masters".[11]

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1 Table XXIX
2 Bartley op. cit. 499
3 D.S.A. 10th Report vii and 4
4 S.C.S.A. A. 203
5 Ibid. A. 4556
6 Table XXXV
7 D.S.A. 2nd Report xxxiv
8 S.C.S.A. A. 535
9 Ibid. A. 1190
10 D.P.A. 1st Report 41
11 Ibid. 9

"Dozens of masters" in 1864 received "not a farthing because they are not engaged in Art Schools".[1] The Department had "no hold on a teacher" once he had gained his certificate. ("They may go to sea or do anything they like", said Cole.)[2] Of 260 teachers who had received certificates up to 1868, only 112 were in Schools under the Department.[3] Although it was claimed four years later that "a trained man finds no difficulty in obtaining employment",[4] the "supply and demand"[5] position now meant that the shortage of the early years had been replaced by a surplus of trained Art teachers. One student in particular felt very strongly on this point. Recent appointments, he said, had been "few and far between". It was "a case of waiting for dead men's shoes", and he had spent five years at the School because he was "waiting for a post", he complained.[6] The Minutes of 1863, which abolished payments on certificates and introduced the full scheme of payments on results, must be seen against this picture of "over supply". They must also be seen as part of arrangements made at the same time for the abolition of the "guaranteed" salaries as part of Cole's scheme for even greater "economy and efficiency".

b) The "salaried" teachers

i) Conditions of service

When the provincial Schools of Design were taken over in 1862, 36 teachers were in receipt of "guaranteed" salaries which bore no relation to the amount of work done[7], but their salaries were not reduced "out of regard for a kind of vested right", it was later stated.[8] These masters cannot have been pleased at Cole's description of them as "old, worn out drawing masters who knew nothing about teaching, and could not get bread and cheese except by professing to teach these schools".[9] In fact, the majority were artists of some repute.[10] While the "guarantees" continued, there were in theory to be no further appointments of this kind. In fact, a "guarantee" was allowed to the Potteries School[11] and to Stoke[12], and was offered to Belfast privately, in

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1 S.C.S.A. A. 4412 (Redgrave)
2 Ibid. A. 4419
3 S.C.S.I. Appendix
4 R.C.S.I. A. 242 (Cole)
5 S.C.S.A. A. 4472 (Cole)
6 Ibid. AA. 2952-2955, 3000 (A. Macdonald)
7 D.P.A. 1st Report 3-11
8 Return of amounts granted ... to Schools of Art [P.P. (1857) XLII (35)]
9 R.C.S.I. A.6020
10 Table XLV
11 MS.M 3.78
12 Ibid. 6.25

an endeavour to persuade the Committee to keep the School open, without success.[1] There was a limited application of the principle of remuneration based on a share of fees, but the "guarantee" was in effect retained, since the salary would be made up to the former level if the share of fees was not great enough.[2] Labouchere was about to end the "guaranteed" salaries completely when he left office, said Cole later, but his successor Henley "nipped the plan in the bud".[3]

It was initially intended that these teachers should take the certificate examination to qualify them for continued teaching, but this was not insisted upon.[4] However, a teacher who moved to a new post was required to take the examination.[5] Cole used his provincial visits to get rid of masters whom he considered to be inefficient. In 1853 he "told Clarke of Nottingham he should resign",[6] and sounded out his successor,[7] before the announcement was made of Clarke's resignation and the re-organisation of the School on a basis of self-support.[8] In 1854, Scanlon of Cork was dismissed, and the School was reorganised,[9] after Cole's visit.[10] In each case the assistants were required to attend the Central School, and before Clarke's successor was appointed, he had to take the certificate examination.[11]

In theory, the "guarantee" remained with the individual only so long as he remained in his post, but J.D.Hammersley of Manchester took his salary with him when he took up a new appointment at Bristol.[12] This must have been an unusual case: the Committee normally "lost" the salary if the master moved, and this often led to the retention of a master whose services could have been dispensed with to the satisfaction of all parties.[13] A Committee could, however, ask the Department to pension off a teacher. After the Sheffield master, Young Mitchell, "made a great mess with the prizes and wearied the meeting", Cole observed that "the Committee wished the Department to superannuate".[14] (Mitchell was eventually pensioned, with the other salaried masters. The reason given was "ill-health"). The Engineer believed that the guarantee system "killed by

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1 MS letter Playfair to Cole 23 August 1855
2 D.S.A. 1st Report 133
3 S.C.S.A. A. 4359 (Cole)
4 Cole MS Diary 23 September 1852
5 D.S.A. 2nd Report xx and MS.M. 1.86
6 Cole MS Diary 14 November 1853
7 Ibid. 19 November 1853
8 MS.M 1.309
9 Ibid. 3.37 and 42
10 Cole MS Diary 16 October 1854
11 MS.M 2.185
12 Chapter VIII section (b) (vi)
13 S.C.S.A. AA. 535 (Cole)
14 Cole MS Diary 10 and 11 February 1863

kindness"[1], and the Art Journal welcomed the certificate and fee scheme as being more likely to ensure efficiency and application on the masters' part.[2]

ii) The end of the scheme

The pensioning of salaried masters was discussed with Local Committees in Ireland in 1854,[3] but Cole did not develop his scheme for "full application of payment on results to Art masters" until 1862.[4] A letter was sent to the masters late that year, setting out a scheme to end the guarantees by pensions.[5] (The pensions were based on the amount of the salary and the length of service)[6] On the same day that the certificate payments were done away with, a Minute also announced the abolition of the "office of masters appointed by the Board of Trade". All twelve remaining masters would be superannuated, but they could earn payments on results if they remained in the service of the local Committees.[7]

c) Teachers' reactions to "full payment on results"

i) General discontent

There was no formal petition to the Department on either of the two main issues, the abolition of salaries and the ending of the scheme of certificate payments,[8] but the "deepest dissatisfaction of teachers and Committees"[9] was reported, and the "demand for a judicial enquiry for the redressal of grievances",[10] led to the appointment of the Select Committee on Schools of Art, as has been recorded.[11] The non-salaried masters saw the abolition of certificate payments as a "direct breach of faith", a phrase which was used by a Local Committee member.[12]

A questionnaire completed by 44 masters revealed their disillusionment, said Sparkes,[13] who had appointed himself as their spokesman. He quoted the 1854 regulations on "fixed payment ... annual payment ... only permanent payments".[14] A student had only continued with his course because he believed that he "would receive money for the certificates".[15] Burchett was quoted as having told students that the possession of a certificate was "like insuring

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1 Engr. 26 March 1858
2 Art J. June 1852
3 Cole MS Diary 2 October 1854
4 Ibid. 28 May 1862
5 MS.M 15.140
6 S.C.S.A. AA.321-322
7 D.S.A. 10th Report 2
8 S.C.S.A. A. 296 (Cole)
9 Art J. January 1864
10 Ibid. April 1864
11 Chapter Three Section (c)(iii)
12 S.C.S.A. A. 609)(Rev. R. Gregory)
13 Ibid. A. 812
14 Ibid. AA. 813-814
15 S.C.S.A. AA. 2914 and 2942 (A. Macdonald)

your life"[1] and "the same as an investment in the funds".[2] "Payments ... are as certain as any other salaries or gratuities", Redgrave was alleged to have told a master "who would never have undertaken a course but for that promise".[3] The payments were seen as "compensation for time lost in training, and unremunerative work with artisans and in elementary schools".[4] The masters had the support of Committee members in their contentions.[5]

ii) <u>The Department's defence</u>

These arguments were strongly refuted by Cole, who said that masters were not "officers of the state", and that payments on certificates were "contrary to all sound commercial principles". Students had been "emphatically told that they signed agreements as officers of Local Committees and were not promised payments for ever". The claim to a "vested interest" would set "a very bad precedent", he believed.[6] He would attach no value to the certificate if he began again, said Redgrave, and he added that such payments encouraged over-staffing,[7] which the Department tried to discourage.[8] On this question of "permanence" it must be pointed out that the certificate itself bore the words "Annual value to be attached to this certificate £ -".[9] A contract had, in fact, been implied, thought the Select Committee, but it said that this should not be seen as a bar to the substitution of new arrangements.[10]

Local Committees "often" appointed a teacher without any reference to the Department, said Cole.[11] It was alleged, however, that Cole had been "harsh and rude" and had directed a student to a post which he did not want to take.[12] Cole was certainly consulted on appointments, as correspondence with Northcote shows. ("Too young to take a class of ladies" was seen as a drawback, but the young man was in fact appointed).[13]

The Treasury had "very liberally agreed that all these old masters should once and for all be superannuated and got rid of" Cole told the Committee.

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1 <u>S.C.S.A.</u> A. 809 (Sparkes, quoting J.P. Bacon)
2 <u>Ibid.</u> A. 3076 (Brenan)
3 <u>Ibid.</u> A. 808 (Sparkes, quoting Baker of Stirling)
4 <u>Ibid.</u> AA. 797-802 (Sparkes)
5 <u>Ibid.</u> A. 4307 (Primrose) A. 1561 (E.Brewtnall)
6 <u>Ibid.</u> AA. 291, 579, 4365 and 4470
7 <u>Ibid.</u> A. 4412
8 Cole <u>MS</u> Diary 7 March 1860
9 Copy at <u>MS.M.</u> 12.174
10 <u>S.C.S.A.</u> xiii
11 <u>Ibid.</u> A. 290
12 <u>Ibid.</u> A. 2992 (A. Macdonald. The teacher was Baker of Stirling)
13 <u>MS</u> letters Northcote to Cole 24 September 1854, 13 October and 22 November 1860. <u>MS</u> letter Redgrave to Cole 5 October 1854.

"They are free to go on being masters, or to emigrate, or to do what they like," he went on. They had "never contributed a farthing", and thus had a doubtful claim in law to such treatment.[1] Eighteen masters (not twelve, as originally stated in the Minute) received pensions of from £36 to £240 a year.[2] (The filling in of the superannuation claims said "little for the clerkly habits of the schoolmasters", Redgrave thought.[3]) Some of the masters were not pleased, nor were the Committees. "My Committee were surprised," said the Glasgow master.[4] The superannuation of Hammersley, by then at Bristol, "was a very bad example ... and diminished local subscriptions", charged Potter.[5] Another master claimed that he was being retired against his will, and talked of "being forced into this".[6] Annual Reports show that ten masters gave up teaching in "Department" Schools immediately, four more left after a year, and that all had given up by 1878.[6A]

Cole contrasted his new system, which would ensure that remuneration was more closely linked with effort, with the old one where, he said, the Department could only "remonstrate" about neglect of duties. He agreed that the master would have to "teach for a year at risk" but pointed out that fees would provide interim support.[7] The teacher would "starve" until results were known and payments made, countered one Committee member.[8] "The keystone of success is a good master," Cole argued,[9] and he refused to countenance an objection that it was "hardly fair to suppose that an honourable man would relax if he were paid a salary".[10] A master would get good results if he was on "cordial terms" with his students,[11] and the "jealousy" of other students would prevent too much attention being paid to those on whom the masters expected the best payments,[12] officials believed. (A case of a master who had been dismissed when students reported that he was encouraging them to draw over tracings was quoted by Cole.[13]) A master could earn a great deal on results, Cole argued,[14] and he ignored one master's suggestion that fixed salaries would ensure that all students would get equal attention.[15]

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1 S.C.S.A. AA. 307-324, 510
2 Ibid. A. 321-322
3 MS letter Redgrave to Cole 6 July 1863
4 S.C.S.A. A. 2776 (C.H.Wilson)
5 Ibid. A. 2222
6 Ibid. A. 3787 (Binns)
6A Table XLIV
7 Ibid. AA. 498-501
8 Ibid. A. 650 (Gregory)
9 Ibid. A. 4329
10 Ibid. A. 3965 (Hollins)
11 Ibid. A. 4201 (Bowler)
12 Ibid. A. 261 (Redgrave)
13 Ibid. A. 262
14 Ibid. A. 560
15 Ibid. A. 2159 (J.P. Bacon)

iii) Consequences

The suggestion that the new system would lead to "cramming" for certificates[1] was typical of predictions, and complaints, which have already been recorded.[2] The chief amendments to the system,"bonuses" to the "most successful" Headmasters,[3] which were replaced by greater all-round grants in 1877,[4] have also been detailed. The masters must have found the system relatively satisfactory, or have been forced by "over-supply" to keep their criticisms to themselves, as there is relative silence on the topic from 1864.

One consequence of the "new" system was the discontinuation of a scheme of annual meetings at headquarters of the "country masters". These were first recorded by Cole in 1853,[5] and the masters were "in excellent temper" in 1855.[6] They included discussion of mutually interesting matters, and officials had "met the masters in the lecture theatre and listened to their views".[7] While a continuation of the scheme was favoured by Sparkes,[8] so far as can be ascertained, the masters never met in one group again. It could be argued that an increase in their numbers prevented this, but it must be taken also as a sign of the worsened relations between the Department and its "provincial agents".

d) Art Teachers' Remuneration

Since Annual Reports do not give details of payments to individual Art teachers, it is difficult to obtain a clear picture of the position. It would be unlikely that masters would ever earn more than £300 a year, Cole originally believed,[9] and it was pointed out that good designers would always earn more than masters.[10] Of 83 masters in 1864, nine did actually earn more than £300, and only 22 received less than £100,[11] at a time when the elementary school teacher's salary was in the region of £90.[12] A master could earn additional emoluments once he had met his "Department" commitments, argued Redgrave,[13] although he had, in fact, reported to Cole in 1863 that "Wardle is now off our books for having undertaken work other than with the Department".[14]

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1 Art J. October 1864
2 Chapter Three Section (c)(iii)
3 D.S.A. 15th Report x
4 D.S.A. 24th Report 224-227
5 Cole MS Diary 3 June 1853
6 MS letter Playfair to Cole 12 July 1855
7 S.C.S.A. A. 4223 (Bowler)
8 Ibid. A. 1119
9 MS letter Cole to Cardwell 28 April 1852
10 Art J. August 1854
11 S.C.S.A. Appendix 33
12 Table XXVI
13 S.C.S.A. A. 4567
14 MS letter Redgrave to Cole 11 August 1863

The chief opponent in the ranks of the masters, Sparkes, received £100 a year from Dulwich College, an appointment for which he had been recommended by the Department,[1] although he claimed that his School took "nearly all" his "spare time".[2] One master taught the royal children; two others had public school posts, Bowler reported. A good master could earn £500 a year, he believed.[3] (Hammersley had an income of £700-800 a year, "but he was an artist",[4]) The middle-class fees were, of course, a vital part of income. Donnelly agreed that they accounted for four-fifths of the remuneration.[5] Cole went further. If a master had to depend only on payments on results, he would starve, the Secretary stated categorically.[6]

The argument that a man could "farm a district for second grade passes" was put forward as a point in favour of increased payments for Advanced work.[7] A master could make £1,000 a year by such "farming", it was alleged[8], but this was doubted by Donnelly.[9] As late as 1892 an advertisement offered a yearly income of £200 for a post at Gloucester[10], which was double the amount that an elementary teacher earned on average at that time,[11] but this may not have been a typical post. There was no pension scheme for teachers. Cole, who would retire on a pension equal to his salary, and obtain a well paid post in addition to this, said this was "no business of the State. A man can make a living and save". Once masters left the Training School they could "float or sink as they pleased. They are in debt to the State for their training".[12] Cole's assistance in securing a pension for a non-salaried master was requested by Playfair in 1861.[13] Cole's answer is not recorded.

e) The position of women teachers

In 1857 the Board noted "public apathy to female teachers arising perhaps from doubt as to a lady's ability to teach Drawing rigidly and precisely". It recommended that certificate allowances should be paid to women teachers, whether they taught "publicly" or not.[14] It was still "difficult to find

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1 S.C.S.A. A. 4567 (Redgrave)
2 Ibid. A. 1313
3 Ibid. A. 4122
4 Ibid. A. 2221 (Potter)
5 S.C.S.I. A. 964
6 R.C.S.I. A. 5954
7 R.C.T.I. A. 1192 (Sparkes)
8 Ibid. A. 1065 (Wedgwood)
9 Ibid. A. 2882
10 S. and A. April 1892
11 Table XXVI
12 S.C.S.A. AA 574-577
13 MS letter Playfair to Cole 3 August 1861
14 MS.M 6.105

Schools for female teachers", since they could not "usually take charge of a School," in 1864.[1] Annual Reports from Schools from 1859 to 1870 show that women were appointed, in subordinate positions: there were never during this period more than eight women so employed in any one year, of which the Bloomsbury School usually accounted for at least four.[2]

After 1870, when the increase in the numbers of women who qualified became very marked, they were, presumably, employed, but many of them must have had to turn to "private" posts. Of the 2,230 teachers who were awarded Third Grade Certificates to the end of December 1899, 1,240 were men, a percentage of 55.6. Of the 462 teachers who obtained certificates beyond Class I, only 80, or 17.3%, were women. Thus, while women qualified to almost the same degree as men, a much smaller proportion were prepared to gain further qualifications, which would suggest that, as a class, they did not view Art teaching in the same light as a full-time career.[3]

f) The Private Schools

Fears of "unfair competition" from "government" Schools appear to have subsided within a few years. There were complaints of "underselling",[4] but before the 1864 Committee one Local Secretary said that all the "private" teachers in his district had been "driven away", not because of his School's "cheapness", but because of its superiority.[5] A Norwich Committee member said that two former masters were now running "private" Schools which were taking away students,[6] but it was reported that a former Manchester master's private venture had ended in failure.[7] Complaints of unfair competition in Edinburgh were groundless, thought its representative.[8] Private teachers did not suffer, Sparkes believed.[9] "There are fewer complaints now", Redgrave said, which would suggest that they had been quite frequent in the past.[10] This was a field in which there was a possibility of even greater friction than in the wider one of "government interference with manufactures". That great difficulties did not develop was, perhaps, because the private Art teachers were less numerous, and less powerful, than the manufacturing interests.

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1 S.C.S.A. A. 4428 (Cole)
2 Table XXXII
3 D.S.A. Calendar and Regulations 1900 26-51
4 Art J. September 1864 (Letter by W.H. Charpentier)
5 S.C.S.A. A. 1626 (Brewtnall)
6 Ibid. A. 2574 (Keith)
7 Ibid. A. 2213 (Potter)
8 Ibid. A. 4287 (Primrose)
9 Ibid. A. 1255 (Sparkes)
10 Ibid. A. 175

g) Later developments in training

i) The decline of the "practical teaching" component

The teacher's certificate was seen as "proof of Art knowledge only ... of competency up to a certain point, but no proof of ability as an administrator or competence as a teacher".[1] This was despite the proviso about "teaching a class" as part of the examination. The "practical teaching" component of the course received less attention with the passing of time. Students complained of "the parochial teaching, on which the Department made money".[2] Only 12 of 34 students did such practice in 1868-69, six only in 1882-83, and two only in 1898-99.[3] "The School makes no attempt to impart the Science of teaching, and as a result ... the services of teachers are nowhere in demand" it was complained in 1890.[4] There was a particularly marked increase of certificated teachers between 1878 and 1882,[5] with a corresponding decrease in the proportion of the more highly qualified.[6] At the same time, only small numbers of teachers were obtaining appointments.[7] It was announced in 1889 that no student would in future receive a grant for more than four years, and that there would be a temporary halt in admissions to the "Training Class" in view of "the small numbers of masters recently appointed".[8]

ii) The Art Class Teachers' Certificate

Increasing numbers of teachers found employment in the Art Night Classes, where the chief instruction was in Mechanical Drawing and allied subjects. Returns for 1871 show that 12 fully qualified teachers found employment there[9], and by 1875 the number had risen to 30, of whom 20 obtained "bonus prizes".[10] An Art Teacher's Certificate was introduced in 1881 as a qualification to teach in these Schools.[11] This was initially a most difficult qualification to obtain (only 28 certificates were awarded to 454 candidates in 1883[12]) but it was simplified in 1886,[13] and there was a great increase in the numbers who qualified.[14] The certificates could be taken at the Central School.[15]

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1 S.C.S.A. AA. 211 and 536 (Cole)
2 Ibid. A. 1137 (Sparkes)
3 Report of the Departmental Committee on the Royal College of Art (1911) 31
4 S. and A. June 1890 ("A.T.S.")
5 Tables XXVII and XXXV
6 Table XXXIII
7 Table XXVII
8 D.S.A. 36th Report xxvi
9 D.S.A. 18th Report 213
10 D.S.A. 22nd Report 382
11 D.S.A. 28th Report xvi
12 D.S.A. 30th Report 347
13 D.S.A. 33rd Report 77
14 D.S.A. 35th Report xxii and Table XXVII
15 Table XXVII

iii) Other developments

At least five teachers found employment abroad, in a School of Art in Bombay.[1] This was later denounced as "a monstrous folly of an attempt to graft British design on to Indian practice".[2] By the end of the period, over 2,000 teachers had been awarded certificates[3], and the great majority must by then have obtained employment outside the Schools of Art, in elementary, "secondary," or private schools. In 1887, Armstrong was able to extend the summer course system, which had proved so successful in the field of Science teaching, to Art teachers.[4] Annual Reports show a general increase in the numbers of applications and in attendances.[5]

How far Cole really meant his statement, in 1864, that he looked "forward to the time" when training could be "given up all together" is debatable. The system of training which he, Redgrave, and Burchett founded continued beyond his life-time and that of the Department. It differed from the "Science training" in that a full-time course was successfully operated from the outset. It shared with the Science side a strong "provincial element", and as both systems progressed, the actual "teaching element" would appear to have declined in importance. The masters were trained in a unique way, in that the sister Department did not organise its "own" Colleges. Their influence on the development of the provincial teaching must have been incalculable.

B) The Science Teachers

a) Training and qualifications 1853-1859

i) The failure of the School of Mines Scheme

The initial scheme for the supply of teachers for the science classes which were to be encouraged by the Department was that the School of Mines would form the "central institution" for this purpose, with the important difference from the Art scheme that the teachers would first secure a preliminary training elsewhere. Seven teachers for the Navigation Schools entered from the Royal Naval School at Greenwich.[6] Four teachers entered from Training Schools assisted by the Education Department[7], although only three, Buckmaster, Williams,

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1 Art J. December 1867
2 Ath. 13 January 1877
3 D.S.A. Calendar and Regulations 1900 26-51
4 D.S.A. 35th Report xxxvi
5 Table XXXVI
6 MS.M 2.34, 3.17 and 5.25
7 Ibid. 3.16 and 5.157 and S.C.S.I. AA. 3808 and 3813 (Coomber)

and Coomber eventually qualified.[1] The Director of the School agreed to provide such facilities, and also arranged for evening classes as part of "a well organised system".[2] The general lack of demand for science teaching, and the lack of real co-operation shown by de la Beche, however, prevented any great development at this time. "If the 1852 Scheme had been carried out ... expense would have been incurred and the teachers would have starved", Cole said twenty years later.[3] "If teachers had been trained, they would have been shut out", Donnelly agreed.[4]

ii) The failure of other schemes

Schemes which involved the School of Mines were given up by 1857, and the "encouragement of science in the Training Schools" was seen as the answer.[5] The Department made a virtue of necessity by saying that there were "different principles for the supply of science masters". It seemed to be "stepping beyond functions to establish a School for training", and "private agency" (the Universities or Training Schools) "should supply the limited need".[6] A scheme to train teachers by means of an additional year's course at Chester Training College was announced, but there would appear to have been no development of this plan.[7] A few teachers with a certificate from the Education Department taught in the small number of classes which existed before 1859.[8]

While the Engineer expressed regret that the plans for a "Science Training School" had "come to naught",[9] and repeatedly pressed for special training,[10] the basic reason for the lack of such an organised scheme was the absence of demand for science classes. The "middle class fees" which so largely supported the Art teachers would not in any case have been available, since even had parents been convinced of the need for the study of science, they would have sent their sons to Universities.[11] Science was not "a mere plaything", said Cole later[12] (implying that Art, to many of the middle classes, was) but it would not have been seen as "a useful accomplishment" for girls.

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1 MS.M 4.108, 5.60, 5.97 and 5.157
2 Ibid. 2.223-224, 3.11, D.S.A. 1st Report lix and D.S.A. 2nd Report xxxi
3 R.C.S.I. A. 5954
4 R.C.T.I. A. 2899 and D.S.A. 16th Report 60
5 Cole Address of November 1857 and D.S.A. 4th Report xxx
6 D.S.A. 5th Report 21
7 Ibid. 21 and MS.M 8.60
8 S.C.S.I. A. 4437 (Jarmain)
9 Engr. 4 December 1857
10 Ibid. 25 December 1857, 6 August 1858, 20 August 1859 and 27 April 1860
11 Playfair Address of 1857
12 S.C.S.I. A. 968

b) The certification scheme of 1859

i) The means of qualification

Cole included "certification" in his notes on the 1859 scheme.[1] The Treasury insisted on this condition before it would entertain the proposals.[2] Initially, teachers could only earn payments if they obtained a certificate at a special November examination, and the payments were increased according to the grade of the certificate they obtained.[3] The question of training did not arise. The "difficulty of obtaining qualified teachers" would be met "by allowing gradual growth, and encouraging intelligent artisans to teach ... thus the government avoids all expenses of training", said the Department.[4] There was an attempt to organise lectures on "method" by Professors, but these were, presumably, for London teachers only, although they were later published.[5] Cole noted that one lecture, by Tyndall, was "simply experiments and not advice to teaching (sic) ... and how to learn".[6]

Although the Department said that it did not wish to draw teachers away from the elementary schools,[7] and since the question did not really arise, as almost all the instruction was given in the evenings for many years, most of the first candidates already possessed the primary Certificate.[8] (For the 1860 examination, seven candidates had been educated at the School of Mines, 31 "privately", and 51 at Training Colleges.[9]) The Department was thus following advice given to "enlist the aid of the schoolmasters".[10] There was also a scheme of "honorary certification" for the holders of University degrees, researchers and scholars who had had worked published.[11] (By 1871, 76 teachers were so qualified, 55 by possession of an Arts degree, 13 on medical degrees, 3 on science degrees, and the rest, presumably, on their research and publications.[12])

A Chester teacher, Davidson, whose evidence was so favourable that Lowe[13] asked him if he had been called by the Department,[14] told the 1864 Committee

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1 Pencil notes by Cole on a MS letter from Lowe, 17 August 1859
2 R.C.T.I. A. 2890 (Donnelly)
3 Chapter Three Section (d)(i)
4 D.S.A. 7th Report 33
5 D.S.A. 8th Report 8 and 23
6 Cole MS Diary 30 April 1859
7 D.S.A. 7th Report 8
8 Ibid. 27-37
9 D.S.A. 8th Report 23
10 Engr. 18 March 1859
11 D.S.A. 8th Report 22
12 D.S.A. 18th Report 86-149
13 Lowe "likened him to Balaam" (Cole MS Diary 25 April 1864)
14 S.C.S.A. Q. 1821

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"I teach additional subjects as fast as I can take certificates". (Davidson had gone on from the Central School of Design to Chester Training College.[1] He was in 1868 the "only teacher in the country qualified in both Science and Art".[2]) Another of the early teachers later talked of "plod plod plod", and said that he had eventually gained seventeen certificates.[3] A limitation on the number of certificates on which payments would be made was proposed by Donnelly, as early as 1861, to "avoid smattering", but Cole believed that this should be considered "after more experiment".[4] There was a gradual increase in the numbers of candidates for certificates, and many came up to improve their grades, not always successfully.[5] "Training was once believed to be indispensable but has been proved to be unnecessary", it was claimed in 1862.[6] "We have learned to do without training masters in the Science branch, or rearing them or cultivating them at all", Cole said.[7]

ii) <u>The abolition of the teacher's examination</u>

Even when the certificate payment was abolished in 1863,[8] the special teachers' examination continued, until 1866. In that year, it was given up, on the grounds that expense was saved, and "greater facility" was given to teachers. A first or second class pass would in future qualify any candidate to earn payments on results.[9] "Many teachers have been encouraged by the abolition", it was later reported, and it was expected that there would be an increase in classes in remote districts where it had, presumably, been difficult to obtain tuition for the "teachers' examination".[10]

This action met with almost universal opposition from teachers who had already qualified, and from Local Committees. Many favoured the re-introduction of the examination, or the imposition of an even higher qualification.[11] Only a first class pass,[12] or the Honours examination[13] should be accepted, it was

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1 <u>S.C.S.A.</u> AA. 1899-1947 (Davidson)
2 <u>S.C.S.I.</u> A. 852 (Cole)
3 <u>S. and A.</u> July 1889 (W.H.Evers)
4 <u>MS.M</u> 13.139
5 Table XXXVII
6 <u>D.S.A. 9th Report</u> viii
7 <u>S.C.S.A.</u> A. 295
8 <u>S.C.S.I.</u> A. 52 (Cole)
9 <u>D.S.A. 15th Report</u> vii
10 <u>D.S.A. 16th Report</u> 65
11 <u>S.C.S.I.</u> A.4511 (Jarmain), A.5098 (Sales), A.5738 (Roscoe), A.7727 (Macadam) <u>R.C.S.I.</u> A.6321 (Miall), A.2196 (Shore), A.4919 (Thompson), A.4094 (Ripley), A.3748 (Moseley), A.5832 (Platt), A.8131 (Unwin) <u>R.C.T.I.</u> A.504 (Curzon) A.570 (Gee), A.754 (Reynolds), A.1807 (Anderson)
12 <u>R.C.S.I.</u> xxviii and <u>S. and A.</u> September 1888
13 <u>Nat.</u> 18 August 1870 ("Science teacher")
13 <u>R.C.S.I.</u> AA. [illegible]

recommended. The Principal of a Training College agreed that the standard was too low[1], but did not "believe that training was necessary".[2] Some, however, believed that "men of position"[3] would not submit to an examination.[4] With the abolition, teachers were loth to sit in the same examination room as their pupils.[5]

The Department justified the abolition by saying that the real test of teaching ability was not a paper qualification, but the achievement of payments on results.[5] The increase in the numbers of teachers, and classes, which followed the abolition, justified the action, its officials believed. "The Free Trade principle of allowing free competition" was quoted by Donnelly.[6] The special examination had been "an unnecessary expense of time and money", argued Cole: the examination was "now taken to the teachers", who had had to pay their own travelling expenses if they failed.[7] The viva had been "not much use",[8] and a "practical chemistry examination" was given up "because of the stinks which were a horrible nuisance to the whole Museum".[9] "A special examination for teachers does not make for better teachers any more than screening gravel makes more large stones", Donnelly later pointed out.[10]

One suggestion never taken up was for a scheme of science pupil teachers. A Science teacher said that he would "welcome such a scheme if there was a reward",[11] and later gave details of his own scheme of assistants who were repaid by the extra attention which he gave them.[12] So long as the teaching remained almost exclusively a part-time and evening employment, however, there would have been great problems of remuneration: once full-time training schemes were under way, the idea seems to have received little consideration.

c) <u>The need for training from 1867</u>

The Samuelson Committee recommended a system of scholarships to induce candidates to enter training courses, but it did not say where they were to be undertaken.[13] There was agreement on the part of officials and Professors for

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1 R.C.S.I. AA. 7912-7913
2 <u>S.C.S.I.</u> A.4003 (Cromwell)
3 <u>Ibid.</u> A. 5156 (Watts) A.5275 (Lawton)
4 <u>Ibid.</u> A. 7730 and <u>D.S.A. 15th Report</u> 76 (Sidney)
5 <u>R.C.S.I.</u> AA. 184-185 (Cole)
6 <u>R.C.T.I.</u> AA. 2980, 3568, 3569
7 <u>S.C.S.I.</u> A. 87
8 <u>Ibid.</u> A. 88
9 <u>R.C.S.I.</u> A. 13
10 <u>D.S.A. 18th Report</u> 54
11 <u>S.C.S.I.</u> A. 4549 (Jarmain)
12 <u>R.C.S.I.</u> AA. 8844 and 8848
13 <u>S.C.S.I.</u> v

training, subject to the proviso that employment could be found by them once they were trained.[1] However, if trained,"teachers would look to the government to find them occupation ... and very few places could at once be found". The Training Colleges should develop their science teaching, so that teachers would be "more qualified to open evening classes", Donnelly believed.[2] Night classes should be seen as a "transient and temporary" solution, Cole agreed with Kay-Shuttleworth, but he expected the "present system to last a long time".[3] "Very few teachers" were specially trained, Iselin said, but he added that there was no evidence to suggest that graduates were better teachers, and argued that one of the most successful was "a common mechanic, not trained".[4] ("A degree is no measure of the capacity to teach", Cole agreed later.[5]) The best teachers, believed Iselin, were "national schoolmasters", but he preferred them, if possible, to have had "some experience of manufactures".[6]

The whole position was, however, changed by the impetus to the development of science teaching given by the Technical Instruction movement, which grew after the Paris Exhibition of 1867, and to which reference has been made.[7] In 1871, conditions were more favourable for the full-time training of science teachers than they had been for such training for Art teachers in 1852, Cole thought. It would be possible, he believed, to devise a scheme for such training "without much additional expenditure".[8] In Cole's view, it would be difficult to enforce entry into the teaching profession of students who had been trained . It would be reasonable to ask for a part repayment of expenses from students who entered industry instead, and the country would have been helped in any case, he argued.[9] Huxley agreed on this point.[10] If a condition to teach were made, it would also make some form of contract that the State should find employment, Donnelly pointed out.[11] The trend was for teachers to come from industry, believed one witness before the Scientific Instruction Commission.[12] Few serving teachers could afford even a year's course to qualify themselves for more advanced teaching, said another witness: he hinted at the development whereby students would enter training courses straight from school.[13]

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1 S.C.S.I. A. 1377 (Iselin) AA.8002-8006 (Huxley), A.8188-8202 (Buckmaster)
R.C.S.I. AA. 273 - 275, 289 (Huxley) A. 8131 (Unwin)
2 S.C.S.I. AA. 176, 426-427
3 R.C.S.I. A.33
4 S.C.S.I. AA. 1361-1375
5 R.C.S.I. A. 5968
6 S.C.S.I. AA. 1376-1379
7 Chapter Three Section (e)
8 R.C.S.I. AA. 6022
9 Ibid. AA. 5977 and 5979
10 Ibid. A. 3044
11 Ibid. AA. 5980 and 6023
12 Ibid. A. 2194 (Shore)
13 Ibid. A. 6025 (Sales)

With more favourable conditions, therefore, the Department was now prepared to reconsider the full-time training which it had so recently declared to be unnecessary. There was "now a higher standard, and a higher key could be set".[1] The need for better training was publicly voiced by Samuelson,[2] but the belief in payments on results as the best test of qualification continued. "To impose the passing of a stringent examination would hinder development in small places ... a most elaborate machinery and great expense would be needed to test the power of teaching," it was stated. At a time when the Normal School was fully operative, there was still "no great outlet for the highly trained science teacher ... able to make a living by that alone".[3] The system of qualification on the ordinary examination was basically unsound, believed Huxley, who pointed out that teachers wrongly claimed that this was a qualification to teach. He wanted to throw the system open to anyone, without examination of any kind, or else to insist upon a special course. He had "no great faith" in "a teacher's examination alone".[4] The part-time nature of the of the bulk of the work meant that had full-time training been insisted upon at any stage, the system would have foundered on a lack of teachers who would have been prepared to follow a full-time course with only the promise of a relatively small financial reward at its conclusion.

d) The Summer Courses

i) Inception

The first practical consequence of the Technical Instruction movement for improved training of teachers was the institution of vacation courses at South Kensington, a development which had more influence, perhaps, than any other on the raising of general standards. "Bringing teachers to London and showing them how to use the common materials to hand in every village" had been first proposed by Huxley.[5] "Breakfast with Donnelly and Huxley", Cole recorded in 1869, "Would organise physiology lectures for teachers".[6] That year saw the first courses, in Light, Chemistry, and Physiology. The Minute which authorised them expressly referred to "instruction in methods of teaching Science"; and 253 teachers attended in the first year.[7] Applications after two years were so numerous[8] that it was announced that the basis for selection would

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1 D.S.A. 18th Report 51
2 N.A.P.S.S. 1874 Report 356-360
3 D.S.A. 29th Report 71-72
4 R.C.T.I. A. 3037
5 S.C.S.I. A. 8000
6 Cole MS Diary 31 January 1869
7 D.S.A. 17th Report 27 and xi
8 Nat. 19 January 1871

be performance at the May examinations.[1] The "high" point in applications was reached in 1875,[2] and the annual numbers in attendance were between 200 and 250 for the rest of the century.[3] Before the Normal School was set up, laboratories were "extemporised" in the School of Naval Architecture buildings while its pupils were in the dockyards.[4] Experience showed that the six weeks period of the initial courses were too long for most teachers, who were, however, especially interested, since they were "more aware of the difficulties, and their own deficiencies, than young lads preparing to teach".[5] From 1873, courses of two to four weeks were held "in the new buildings, specially fitted up".[6] There could still be complaints of "a favoured few from a host of applications" twenty years after the courses began.[7]

ii) Organisation

A description of Huxley's course in 1871 showed that the students worked a five and a half day week, with a morning lecture followed by the rest of the day in practical work. There was "no difficulty with a mixed class". (In that year, a woman headed Huxley's course list,[8] while a woman who attended in 1876 later "answered the Cambridge Science Tripos, and would have been head, and is now the Head of a large middle class school".[9]) The construction of instruments was an important feature of the Physics course.[10] In 1875, Nature said that it was realised that the teachers "knew nature as words, not living facts". In paying tribute to "the administrative genius of Major Donnelly," it said that the country was "indebted to him for the action in bringing teachers to London, organising allowances, and so on". It talked of men "thirsting for information ... a chance which may never recur ... knowledge means bread and cheese for their families".[11]

How far there was actual teaching of "method" is difficult to discover. In 1894 it was announced that future courses would be concerned only with this aspect, which would suggest that there had been a considerable concentration up to that point on the acquisition of "content", and the learning of techniques, for which provincial facilities now existed.

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1 D.S.A. 18th Report 29
2 D.S.A. 22nd Report [illegible]
3 Table XXV
4 D.S.A. 19th Report [illegible]
5 D.S.A. 18th Report 54
6 D.S.A. 20th Report [illegible]
7 S. and A. August 1891
8 Nat. 24 August 1871
9 D.S.A. 25th Report 33
10 Nat. 15 July 1875
11 Ibid. 15 July 1875

iii) Influence of the courses

There were many tributes to the importance of the courses. A teacher wrote to a Professor to say how he had learned far more in one week on a Chemistry course than in a year "on his own", and told of a laboratory which he had fitted up for his students on his return.[1] The courses were welcomed "because many masters are so extremely ill-educated".[2] In testifying to the benefit he had received from three courses, one teacher suggested that a good basis for selection would be a consideration of the ultimate advantage to a particular area.[3] "Nearer two thirds than one third of Chemistry teachers" were "now competent because of summer courses",[4] and teachers who attended were "far superior to the majority" officials believed.[5] Twenty teachers (including Goffin) testified to the value of their course, and asked for the supply of cheap models so that they could follow up work in their own schools.[6]

In one aspect of development the courses had even wider significance. "The most important step ever taken in science teaching", was Huxley's description of the courses.[7] Although he did not put on a Biology course until 1871, his classes have been seen as preparing the way "for a total revolution in methods of biological study".[8] "The teaching of the subject in Schools of Science" had "already been profoundly affected" by 1878.[9] Huxley hoped that his "Schoolmasters will be able to do the papers by the time that I am finished with them",[10] in 1872. When Tyndall urged him "to give up your schoolmaster's course and come to Switzerland",[11] he declined, and said, "I have a new system here, and if I mistake it not, it will grow into a big thing and bear fruit".[12]

Details of the summer courses published in Annual Reports to 1892, show that a Chemistry course was held in every year. A course in Physics, in one or other of its aspects, was also given annually, while other courses at less

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1 R.C.S.I. A. 5754 (Frankland)
2 Ibid. AA. 7432-7434 (Roscoe)
3 Ibid. AA. 8941-8948 (Jarmain)
4 Ibid. A. 5905 (Iselin)
5 R.C.T.I. A. 3115 (Abney)
6 Ed. 25.30 (21.5589 16 July 1874)
7 R.C.T.I. A. 3037
8 George Haines IV German influence upon scientific instruction in England 1867-1877 Victorian Studies I (University of Indiana Bloomington 1957-1958) 230-233
9 D.S.A. 25th Report 33
10 MS letter Huxley to Hooker 31 July 1872
11 MS letter Tyndall to Huxley 3 June 1872
12 MS letter Huxley to Tyndall 4 June 1872

frequent intervals gradually covered the whole of the Directory subjects.[1] The importance of the courses becomes apparent when the paucity of other facilities, particularly at the period of their inception,[2] is considered. While teachers could attend more than one course, annual figures show that by the end of the period, over 5,000 individual attendances had been recorded.[3]

As a result of the success of the Summer courses, the Department could begin to deprecate the "self taught teachers"[4] about whom it had previously been so laudatory. The "best" teachers "came up to Summer courses", it could say, when talking of "teachers in mere possession of a certificate ... teaching text-books in hand".[5] A teacher of long standing could compare "the early days with the present" in 1889: "There were no text-books and there was no instruction at all ... £100 would not have bought the kind of aid given in the summer courses today".[6] Again, the Department had adopted a method which was to have far-reaching results, with a minimum of expenditure.

e) Full-time training

i) The Normal School courses

The tenacity of Huxley, and the flexible interpretation of regulations by Donnelly and Cole, as have been recorded,[7] were responsible for the setting up of the Normal School of Science at South Kensington. The first "fifteen teachers in training" attended a "year's course in the new buildings of the Royal School of Mines" in 1874[8]. Initially, students followed a year's course in separate subjects,[9] although the length of the course attendance could be extended to include other subjects. The "need for popular and imaginative instruction" in the School was noted by Huxley[10], and there is little doubt that his own approach,with a readiness to use visual aids and a willingness to enter into discussion,[11] was popular with the majority of his students. (One dissentient, however, believed that he "made his points with too much rapidity ... and you got his opinion without learning to form your own".[12]) Huxley's stress on the over-riding importance of the student's own observations and deductions

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1 Table XXV
2 R.C.S.I. A. 5905 (Iselin)
3 Table XXV
4 D.S.A. 19th Report 43
5 D.S.A. 22nd Report 385
6 S. and A. July 1889 (W.H.Evers)
7 Chapter Seven Section (a)(iii)
8 D.S.A. 21st Report
9 Table XXIII
10 MS notes by Huxley on reverse of MS letter (copy) to C.J.Faulkner 9 October 1881.
11 St.G.Mivart Some Reminiscences of T.H.Huxley N.C. December 1897.
12 H.E. Armstrong op. cit. 11

meant to H.G. Wells that "the year spent in his class was the most educative in my life".[1] Wells disliked his subsequent courses, however. He believed that "the Normal School had been "hastily compiled" and was, as a result, "quite unsure of what to do with itself". Huxley's insistence on his own freedom to develop his ideas meant that other lecturers, who were less able, used their independence in less valuable ways. The Physics course, believed Wells, was "dull", and the construction of instruments from basic materials was "irrelevant and stupid ... instead of a scientist, I became an amateur glass-blower and carpenter". The Geology course "was all rote-learning". Wells made a major criticism when he said that the School "never had a chair, a lecturer or a course in educational science or method". (He was also highly critical of the lack of pastoral care, saying that he "paid in health all my life for my South Kensington days".)[2]

ii) <u>The influences of the Normal School</u>

Replies to a circular in 1878 showed that 74 students who had completed full time courses had been able to form classes under the Department, but that 62 students had either been unsuccessful, or had not attempted to do this.[3] A comment in 1888 suggests that there was a "condition to teach" before acceptance. "Many head teachers proved unfriendly" it was said, so that many young men who had been "sincere in their promises were unable to fulfil them".[4] (Donnelly warned the students at a prize giving in 1882 that they would not always be welcomed by their less trained colleagues.[5]) Criticisms of students as "young men with their hands in their pockets at 5/- a day ... of whom only a small percentage become teachers",[6] and that "few enter the profession for which they have received expensive training ... because research pays better",[7] were also made.

As the Normal School developed, courses were offered which covered all the courses in the Directory. (Agriculture, for example, was introduced in 1883[8], but was suspended in 1899 because the numbers of students had become so small[9]: the vicissitudes of this subject have been detailed.[10]) This led to a complaint that teaching was "falling into the hands of specialists",[11] but it

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1 H.G.Wells <u>op. cit.</u> 11
2 <u>Ibid.</u> 200, 207-237 (Wells failed his final examinations, but ultimately gained a London B.Sc. degree)
3 <u>D.S.A. 25th Report</u> 33
4 <u>Engr.</u> 11 May 1888
5 <u>Nat.</u> 6 July 1882
6 <u>Engr.</u> 4 May 1888
7 <u>Ibid.</u> 20 April 1888
8 <u>D.S.A. 30th Report</u> 342
9 <u>D.S.A. 46th Report</u> xxiii
10 Chapter VI Section (c)
11 <u>S. and A.</u> February 1891

could be seen as a natural consequence of the more advanced teaching facilities which were gradually being developed. "The need of a more organised supply of good and thoroughly trained teachers"[1] became more pressing with the development of improved facilities with the advance of the century.[2] The "increasing numbers of teachers from the School of Mines" (sic) was favourably noticed[3] and the attainments of untrained teachers were deprecated. "With many, theory outweighs practical knowledge"[4] ..."it would be a great advantage if they were qualified to teach"[5]... "they must not merely know the facts, but also how to teach"[6] commented officials.

It would appear to be difficult to reconcile these views which were, presumably, directed at teachers who had not studied at the School, with the opinions of H.G.Wells that there was no instruction in method. "You learned Geology ... and thus could teach it", he believed.[7] The resultant quality of the teacher must have depended in any case, to a very great extent, on the approach to the studies made by the lecturer. (There was never, as far as can be discovered, any practical teaching in local schools). It is, perhaps, wrong to criticise this lack of teaching, as distinct from learning, experience, which parallelled developments in the Art Training School at the time, in the light of modern views. The foundation of the Normal School must be seen as the first real attempt to provide full-time courses of training for science teaching, and it provided a basis on which developments could continue in the new century.

f) Other forms of encouragement and training

The Department announced a scheme in 1854 to send Art masters to the Paris Exhibition of that year, granting £10 aid towards their expenses, and marking it a condition of such aid that they should submit reports of their visits and observations.[8] This aid was extended to Science teachers,also,for the Paris Exhibition of 1867.[9] Teachers who had "taught for two years, and passed not less than thirty students" were helped to visit the Museum and

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1 D.S.A. 40th Report lviii
2 Chapter VI Section (i)
3 R.C.S.E. A. 7736 (J. Easterbrook)
4 Ibid. AA. 10283, 10287 (C.A. Buckmaster)
5 Ibid. A. 10280 (G. Redgrave)
6 D.S.A. 40th Report lviii (Donnelly)
7 Wells op. cit. 230
8 D.S.A. 3rd Report xxxi
9 D.S.A. 15th Report 19

"Metropolitan institutions" in 1868.[1] 330 teachers in all visited the International Loan Exhibition in 1876 on the same basis, and were, in addition, given special lectures on the use of various types of apparatus.[2]

From 1887, the Department also helped with the fees of teachers who attended courses at provincial Colleges and Universities. Following a memorial from Lancashire and Cheshire teachers, it announced that it would pay three quarters of their fees for two days a week spent at Owens College.[3] This was extended to Sheffield and to Birmingham in 1881,[4] to Leeds in 1884,[5] and later to Cardiff and to Dundee.[6] An increasing number of teachers availed themselves of this opportunity to gain further qualification in "knowledge," as distinct from "method".[7]

g) Payment on results, and general remuneration

i) Sources of teachers

The absence of middle-class support for science classes, as has been recorded, had its effects on the development of the classes, which were held in the evenings,"since persons of the operative classes leave school at 12".[8] This in its turn had its influences on schemes for training, as has been recorded, and on the sources of supply of teachers. The Department did not "contemplate the withdrawal of men from the useful handicrafts to become teachers of science, but thought that during the winter months it might be made a useful addition to a man's ordinary income".[9] "Encouraging the intelligent artisan to teach" and "thus avoiding the expenses of training",[10] and beginning by "finding a man already engaged",[11] were cardinal items in early policy. "The best students in their turn would become teachers", it was hoped.[12]

The 1859 scheme really showed marked progress at a time when elementary teachers saw their salaries threatened by the terms of the Revised Code of 1862. As average full-time earnings fell, so the number of evening classes rose.[13] Of

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1 D.S.A. 16th Report 8
2 D.S.A. 24th Report 10
3 D.S.A. 25th Report 1
4 D.S.A. 27th Report 4
5 D.S.A. 30th Report 5
6 D.S.A. 32nd Report 7
7 Table XXIV
8 D.S.A. 16th Report 7
9 N.A.P.S.S. 1862 Report 350-351 (J.C.Buckmaster)
10 D.S.A. 7th Report 33
11 S.C.S.I. A. 726 (Donnelly)
12 R.C.S.I. A. 18 (Cole) and D.S.A. 16th Report 59
13 Table XXVI and R.C.S.I. xx

867 teachers in 1870, 556 were elementary teachers, and clerks, surveyors, draughtsmen and mechanics formed the majority of the rest.[1] The fact that Science teaching was thus "hardly ever followed as a profession" meant that if the teacher's full-time occupation entailed a move, the evening classes had to close.[2] "Men teach for a year or two and then go off", it was believed, because they were "bad teachers", or did "not possess sufficient energy to stir up the town",[3] or were simply "incompetent".[4] One consequence of this factor was the high proportion of "ephemeral" classes in the early days of the scheme, but these gradually declined in proportion as it developed.[5]

ii) The first effects of payments on results

Donnelly wanted full payments on results from the outset,[6] but Lowe had "no wish to alter ... the higher award for the higher certificate".[7] The abolition of this certificate allowance, from 1862,[8] was approved by an H.M.I., who agreed that it was "best to pay on passing, and to test teaching, not qualifications".[9] The Department stressed, after its experience with Art teachers, that "payments must not be looked upon as permanent".[10] Their appointment was entirely a matter for the locality, it was argued also.[11]

There was a "horrid outcry"[12] and a "panic"[13] when the 1869 regulations reduced the classes on which payment would be made from five to two[14], and there were deputations and complaints[15], which "much grieved" Forster, the Vice-President.[16] In general, however, the teachers appear to have been fairly satisfied with the system in its early days,because it provided useful supplementary earnings. Payments were "high in proportion to the work done", claimed Donnelly.[17] A "good teacher" could "easily make £150 in the evenings and not work in the day at all", he believed.[18] A Manchester manufacturer believed that

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1 R.C.S.I. Appendix xii
2 S.C.S.I. v
3 Ibid. AA. 73, 75, 96 and 98
4 Ibid. A. 8195 (J.C.Buckmaster)
5 Table IX
6 S.C.S.I. A. 542
7 MS letter Lowe to Cole 7 September 1861
8 S.C.S.I. A. 52 (Cole)
9 MS letter Cowie to Cole 23 August 1862
10 D.S.A. 13th Report 12
11 S.C.S.I. A. 101 (Donnelly)
12 R.C.S.I. A. 143 (Cole)
13 D.S.A. 19th Report 35 (Donnelly)
14 D.S.A. 17th Report 1
15 Ibid. 6
16 Cole MS Diary 7 February 1870
17 D.S.A. 16th Report 59
18 S.C.S.I. AA. 78, 79 and 81

"£250 is the least salary for a competent teacher".[1] Cole felt that "to earn £200 involves a great deal of slavery", and said that there were "few schools where a teacher could earn the living of a fourth rate tradesman".[2]

iii) Individual remuneration

Until 1875, Annual Reports show the payments made to individual teachers, and it is thus possible to obtain information on the incomes earned by the most successful teachers. Two men figure prominently. W. Busbridge, who had begun life as an apprentice carpenter, and had first qualified in the "ordinary" May examinations in 1865, organised classes in Mechanical Drawing and allied subjects in many parts of London. He received £598 for his work in ten schools in 1873-1874, and in the following year his earnings were the highest ever recorded, £631. Although payments are given by schools from that point, it is possible to discover that he received at least £394 in 1876-1877. However, his "classes all over London told on his health",[3] so that his earnings probably diminished. W.T. Rowden first qualified in the second teachers' examination, in two subjects, in 1860. He took five more certificates in 1861, and a further five in 1862. He earned £304 in 1871-1872, £333 on ten subjects and 165 students in 1872-1873, and £335 in 1873-1874. (A Belfast teacher who taught 15 subjects to 105 students in 1872-1873 received only £166, in comparison). Statistics compiled from Annual Reports show that 127 teachers earned over £100 in 1873-1874, at a time when a full-time elementary teacher's average earnings were approximately £100.[4] During the period for which it is possible to compile this information, however, such teachers were never more than a small percentage of the whole.[5] Restrictions on total payments, to which references have been made[6], reduced such amounts from time to time.[7]

"Peripatetic" science teachers were advocated as one means of spreading the influence of the Department,[8] and the early schemes of the Lancashire and Cheshire Union placed much reliance on this device.[9] While only a small number of teachers taught on this basis in the very early days, by 1877 approximately one teacher in seven was teaching in more than one school, and

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1 S.C.S.I. A. 5833 (Platt)
2 R.C.S.I. AA. 5960-5961
3 S. and A. March 1888
4 Table XXVI
5 Table XXXVIII
6 Chapter VI Section (d)
7 Table XXXVIII
8 Engr. 8 April 1870 and Cole MS Diary 5 February 1865
9 Chapter XVII Section (iii)

earning considerably above the national average in doing so.[1] The travelling teacher grew less popular, however, as the supply of teachers grew, and as the Department endeavoured to encourage practical work. Efforts were being made to put down the practice by 1886, "because such teachers carry their apparatus in a hand-bag, and thus reduce practical work to a minimum".[2]

The "supplementary" nature of the work continued to the end of the period (and is,of course,still an important feature today, although not to the same degree). One of the Department's most successful teachers, who was specially commended for his efforts,[3] had to rely on his analytical work for the major part of his income.[4] The Middlesbrough Mechanics' Institute tried several times to start classes, retaining fees but allowing a Halifax teacher to have all the Department grants,[5] paying a fixed sum of £30 to the Borough analyst and keeping the fees and grants,[6] and then giving the fees and 70% of the grants to a local steel-works chemist.[7]

iv) Demands for other methods of remuneration

While, in general, teachers' objections were not to the system, but to changes which threatened their earnings, Manchester teachers favoured a capitation system as early as 1868.[8] Nature argued for this measure in 1871, when it described remuneration as "utterly inadequate".[9] The question of fixed salaries was,of course,involved with the question of training and sources of teachers and the development of more advanced work. A "stipend" was seen as vital to this,[10] but representatives of the Department did not believe that specially trained teachers should get higher pay, since their training should,in effect,enable them to obtain better results and consequently higher payments.[11] "Permanent centres ... where teachers are without direct pecuniary interest" and "fixed salaries for many teachers",[12] were features which came about with the developments under the influence of the "Whisky Money" in the last decade of the century. The Department was concerned that salaried posts should become a regular feature of the day classes,"as otherwise

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1 Table XXXIX
2 D.S.A. 33rd Report 104
3 D.S.A. 8th Report 23
4 S.C.S.I. A. 4881 (Jarmain)
5 Middlesbrough Mechanics' Institute MS Minutes 8 September 1870
6 Ibid. 15 September 1871
7 Ibid. 13 June 1882
8 S.C.S.I. A. 5156 (Sales)
9 Nat. 21 September 1871
10 S.C.S.I. A. 4094 (Ripley)
11 R.C.T.I. A. 3039 (Huxley) A.3130 (Abney) A.3591 (Donnelly)
12 D.S.A. 38th Report 34-35

a considerable part of the money expended in the encouragement of new forms of education must be wasted".[1]

v) Drawbacks of the scheme

Some voluntary schools advertised that teachers might organise evening classes to supplement the inadequate salaries which were offered for full-time employment, and the Department "frequently remonstrated on this".[2] The Department knew that where teachers earned up to the limit of the Education Department grant without "science" subjects, that they carried on work in these fields in the evenings to gain additional income.[3] Such factors as these encouraged the "teaching for the pot"[4] which was one of the worst features of the system.[5] "Almost all teachers say that cram pays better than intelligent teaching", believed one critic, who quoted the case of a teacher who declined the loan of specimens "because he could pass pupils better if he left the practical work alone".[6] The circumstances of limited training, and dependence on results encouraged this approach, Donnelly agreed with Kay-Shuttleworth.[7] The syllabuses published in the Directory were one attempt to "prevent vague and desultory work ... and cram",[8] and other methods too, were adopted.[9] Students complained that teachers dismissed questions asked in class as "not in the examination".[10] As late as 1895 it was charged that "too many teachers ... cram for the May examination, while students, after a nine and a half hour day, want work which has more bearing on their occupations", but, equally, many teachers now found the examination requirements and syllabus directions increasingly irksome.[11]

The recommendation of the Royal Commission on Technical Instruction, that "teachers' pay should not be so dependent on grants",[12] took many years to be accepted. Accusations of "sweating",[13] and "miserable pittances of teachers ... dependent on results",[14] continued to be made. "Good science teachers do not beg because their teaching is wanted and paid for," argued the

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1 D.S.A. 40th Report lviii
2 D.S.A. 34th Report 51
3 D.S.A. 20th Report 45
4 R.C.S.I. A. 157 (Cole)
5 Chapter VI Section (f)
6 R.C.S.I. AA. 6245 and 6251 (Miall)
7 Ibid. AA. 6099 and 6102
8 D.S.A. 16th Report vii
9 Chapter VI Section (d)
10 S. and A. July 1889
11 Engg. 1 February 1895
12 R.C.T.I. 522
13 Engg. 22 November 1889 (G. Halliday)
14 S. and A. November 1889

Engineer,[1] but even Abney agreed that teachers were not, in general, paid enough.[2]

The way of the teacher cannot always have been easy. One teacher in 1864 had to provide meals for his students so that they could complete engineering drawings on which he would receive payments.[3] Another told the Samuelson Committee that he "could lose £50 if students stay away from examinations because of a shower".[4] A visit by the Queen to the "Peoples Palace" on an examination evening meant that some unfortunate teachers were unable to hold their examinations, and faced a loss of 75% of the grant.[5] In 1890, a teacher had to round up his students from a cricket match, "piled them into cabs ... and ... landed them in flannels in the examination room".[6] Teachers were advised to "spend the first few evenings in such a way ... that the student concludes that it is not as bad as he had feared. Then tighten the rein and bring them under control".[7] Model answers were recommended, "because the teacher is bound to see that the student is not landed on the wrong side of the fence through the want of a little information on the kind of answer expected.".[8] "A visitor's night at every fourth meeting, to which ladies may be brought", with demonstrations of the more spectacular experiments, was a feature of Middlesbrough Chemistry classes in 1861,[9] and at the end of the century, the same devices were being used to popularise classes in London.[10]

vi) The Department's defence

The Department's officials naturally defended the system of payment, "It ensures that work is done ... that there is efficient use of public funds in distant parts ... whatever the case with lazy fellows, the industrious man does well". None of the best men had lost, but had actually gained under the system, claimed Cole.[11] These "best men" preferred the system, Donnelly agreed.[12] The Department was never, officially, concerned whether teachers were salaried or paid on results. An Aberdeen teacher was told in 1886 that "the Department

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1 Engr. 18 September 1885
2 R.C.T.I. A. 3120
3 S.C.S.A. A. 3883 (Hollins)
4 S.C.S.I. A. 5333 (Angell)
5 S. and A. April 1889
6 Ibid. April 1890
7 Ibid. October 1889
8 Ibid. April 1890
9 MS Minutes Middlesbrough Mechanics' Institute Advertisement of September 1861
10 Tsuzuki The Life of Eleanor Marx (Oxford Clarendon Press 1967) 296
11 S.C.S.I. AA. 53-55
12 Ibid. A. 542

does not appoint masters ... this is left to local authorities ... it has gone as far as it can in acknowledging you as qualified to earn payments in Science subjects".[1] Even when the system of payments was abolished at the very end of the period, it could be argued that "results" still operated, since students "voted with their feet" and only continued in their attendance if teachers were successful. It is notable, as has been recorded[2], that when schools were given the option of payments on results, or on attendance combined with inspection, three quarters of them chose the old system.[3]

h) The Goffin case

i) The first charges

The "Goffin case" was to form one of two incidents, involving teachers under the Department, which became minor causes celebres[4], and it particularly accented the dangers and drawbacks inherent in the system of payment on results to which reference has been made,[5] especially in the sphere of examination paper "security". It involved a Parliamentary enquiry and a civil action, many questions, a long debate in the House of Commons, and the publication of five sets of Parliamentary Papers.[6] While the Department and its officials emerged successfully from the four year period which it covered, there was a great deal of criticism of its methods during that time.

R.E.H.Goffin, a teacher who held the certificate of the Education Department, had first qualified under the 1859 regulations when he obtained a Grade III pass, in Acoustics Light and Heat, in 1860. He gained two further certificates in 1861, but was unsuccessful in his attempt to improve his grade in 1862. He organised classes under the Department while he served as an elementary school teacher until 1874, but he does not appear to have earned large sums thereby. He was one of the first teachers to attend the Summer courses at South Kensington. In 1874, Goffin was appointed Headmaster of the

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1 P.M. S. 10. 703 (Letter of 20 April 1886)
2 Chapter V Section (c)(v)
3 D.S.A. 44th Report 3
4 The other case was that of Dr. Aveling. (Chapter XVI)
5 Chapter VI Section (f)
6 "Papers and Correspondence between the Science and Art Department and the Committee of Class 3150 relating to the examination of 16 May 1878". [P.P. (1878-1879) LVII]
"Report from the Select Committee on Mr. Goffin's certificate" [P.P. (1878-1879) X] (S.C.G.C.)
"Correspondence between the Education Department and the Governors of the United Westminster Schools" [P.P. (1880) LV]
"Copies of further correspondence between the Education Department and the Governors of the United Westminster Schools" [P.P. (1881) LXXIII]
"Correspondence since August 1881 between the Education Office, the Charity Commissioners and the Governors of the United Westminster Schools" [P.P. (18
In general, the details of developments given below are those related before the

United Westminster Schools (now the Westminster City School) at a salary of £500 and began to organise "Department" classes there. In three successive years he earned £86, £355 and £386 on results.[1] There seems to be little doubt that he was an extremely gifted teacher, if the ability to get his pupils through external examinations, such as those of the Cambridge Local Examinations, was a test.[2] His Governors later said that "due to his efforts the School had been raised from nothing to 550 boys".[3]

In May of 1878, Donnelly later related, a man came to see him and alleged that Goffin was engaged in fraudulent practices. The informant produced a set of notes which,he charged,had been made by a boy on the previous day, before the Chemistry examination that evening. (Donnelly at first refused to name the man, but later,when directed to do so,said that he was W. Davis, a local Science teacher). Donnelly, Iselin and Abney immediately went to the School, examined individual boys and their notebooks, and "discovered undeniable proof of frauds (which) were of a magnitude and organisation never before seen". The officials were certain that Goffin had opened the envelopes containing the papers before the examination,and coached the boys in their answers. Smith, the Secretary, claimed that the papers had never left his charge, but Donnelly said that they were delivered to Goffin's house by the school porter. The notebooks were later examined by Frankland and Roscoe, who concluded that it was impossible to predict questions as closely as Goffin claimed to have done. The Department confined its charges to the Chemistry examination, and made no suggestion that any of the members of the adult classes, also taught by Goffin, were "primed".[4]

Within a fortnight of the investigation, Goffin's qualifications had been "cancelled for ever", and the Local Secretary, Smith, was similarly disbarred.[5] The Governors were informed of this.[6] The Department refused to pay the Committee on any of the examinations held at the School. A prolonged correspondence with the Governors followed, of which the upshot was that the

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1 Details from Annual Reports
2 Hd. CCLXIV (1881) 1281
3 P.P. (1878-79) LVII (Letter of 6 June 1878 to the Department)
4 Information summarised from P.P. (1878-79) LVII and Hd. CCLXIV (1881) 1266-1271
5 P.M. VIII 1
6 Letter of 29 May 1878 (P.P. 1878-79 LVII)

Department asked Waterlow, the Chairman, to raise the matter in the House.[1] The Department noted that Goffin had been elected to the Council of the National Union of Elementary Teachers,[2] and the Union added its voice to the demand for a Parliamentary Enquiry.[3] The House set up a Select Committee which had Lowe as Chairman,and Hamilton, the Vice-President, Waterlow and Errington as members.[4]

ii) Further charges, and defence

The Committee, before which Donnelly was the only witness from the Department, held seven meetings in July and August 1879. Before it reached its decision, it had had to listen to charges and counter-charges which ranged far beyond the circumstances of the previous year's examinations. The Department claimed that Goffin's history in his dealings with it had long been one of suspicion. Identical mistakes in his own and his pupils' papers in 1865 had led to his being questioned, and his class had broken up. In 1867, the Secretary of the School in the next parish had told Iselin that Goffin was showing his pupils the questions before examinations, and "he had left the place as a bankrupt", after "defalcations in a Coal Club and a Penny Bank". There had been reports by seven different Inspectors which suggested "close scrutiny of his conduct". The rule limiting the number of subjects per student in one year had been brought in "solely because of him", and Richmond had signed a Minute in 1872 which said "Inform Mr. Goffin if any repetition of circumstances, certificate withdrawn". Payments had been cancelled in that year and again in 1873, when he had falsified registers.

Teachers and former teachers at the Westminster School claimed that Goffin's conduct was known to many of his staff. Goffin,in his turn,argued that it was possible to predict "cram questions". He charged that Davis, the original informant, had suffered financially when the Westminster classes opened, and that when he applied, unsuccessfully, for the post of assistant master at the School, he had tried to bribe Goffin. He alleged that there was a conspiracy of masters against him. He demanded that the Department should produce the boy whose notes had been shown to Donnelly.[5] He was particularly

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1 Letter of 3 February 1879 (S.G.G.C)
2 P.M. XI 116
3 P.P. (1878-79) LVII (Appendix)
4 Hd. CCXLVIII (1879) 300
5 Lord George Hamilton later told the House that the boy had,in fact,been discovered,after a comparison of the hand-writing of the notes with that in the answer papers. [Hd. CCLXIV (1881) 1274]

vehement about Donnelly's behaviour at the School investigation, saying that he had been "in a passion," and had used parade ground language, calling the boys "infernal young scamps" and "incorrigible liars". He claimed that Donnelly had promised leniency if he confessed, "as there was no doubt about his guilt". (On this point, the officials denied "any heat", and claimed that an immediate enquiry was vital, or the boys would have been "primed once again".)[1]

The decision of the Select Committee was that Goffin was guilty of the offences with which he had been charged. He had "carried on a system of fraud" which had "greatly lowered the tone of morality among a large body of students and teachers," and which had been "reduced to a system and almost elevated to the dignity of an art". They believed that the matter required the attention of the Education Department, and that "steps should be taken to prevent a repetition of these disgraceful practices".[2] The Department issued a Circular which said that the case showed that "care and vigilance is lacking in Local Committees", tightened up the security regulations, repeated the charges against Goffin, and issued a challenge to the Governors to prosecute for perjury.[3]

iii) Further developments

The matter did not end with the Select Committee's findings. "Goffin is not yet dead", Donnelly told Huxley two months afterwards.[4] His Governors were adamant that Goffin had been wrongly treated. They said that Goffin had not been allowed counsel, and had not been given the chance to cross-examine witnesses, or even to hear their testimony. A further prolonged correspondence took place, which ended with "My Lords" repeating the suggestion that the Governors should prosecute for perjury.[5] Goffin, meanwhile, had claimed in a letter to The Times that questions in examinations were "so frequently repeated that no fraudulent means are necessary to find out the idiosyncrasies of examiners".[6]

Goffin then took up the gauntlet by bringing an action for slander against Donnelly, whose defence was placed in the hands of the Treasury Solicitor.[7] The action was heard in the Queen's Bench Division on 25 February 1881. It set a precedent as the first case which involved an

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1 Memorandum of 26 November 1878 (S.G.G.C.)
2 S.G.G.C
3 D.S.A. 27th Report 3-7
4 MS letter Donnelly to Huxley 16 September 1879
5 P.P. (1880) LV (Minute of 21 November 1879)
6 Times 8 August 1879
7 P.M. XIV 305, XV 30

alleged slander before a Committee of the House of Commons. The Attorney-General argued that the case was a breach of privilege, although he believed that an action for perjury would have been permissible. The Court stopped the case, and said that the plea of privilege was a "perfectly good one". It stated that Donnelly had said that he was not actuated by malice, and he had been a witness before a tribunal which had compelled his attendance. Some sympathy was expressed for Goffin, but "the necessary administration of the law" had "the greater interest over any question of justice". No evidence was heard, and costs were given against Goffin.[1]

Lord George Hamilton then revived the case in the Commons in an attempt to force Goffin's removal from his Headship. He said that Goffin's case had "been laughed out of court", but that it had served his purpose as a delaying action.[2] In a letter to The Times, Goffin denied these imputations. He implied that Donnelly had tampered with lesson notes, said that his own solicitors had advised that a charge for perjury would have been hard to sustain, and asked why he himself had not been tried for fraud or perjury.[3] The position of Goffin's continued employment was complicated by the fact that the United Westminster Schools, as a "secondary school, preparing boys for commercial pursuits",[4] came under the Charity Commissioners, and not the Education Department.[5] Mundella, the Vice-President, believed there was nothing that he could do.[6] On a technicality, Goffin could not be tried for fraud in years previous to 1878, since payments had been made to the Local Committee, who had certified that all was in order.[7] After more correspondence, the Charity Commissioners agreed to refer the matter to the Attorney General,[8] but nothing more is heard of the case.

iv) The consequences of the case

There is no further reference in Annual Reports to any classes at, or payments to, the United Westminster Schools. Goffin's Union accepted the Select Committee's verdict, but were accused on the one hand of shielding fraud, and on the other of deserting Goffin, who remained as Head until after the

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1 The Times 26 February 1881
2 Hd. CCLXIV (1881) 1271-1277
3 The Times 13 August 1881
4 Hd. CCLXIV (1881) 1279
5 Ibid. 1267
6 Ibid. 1298-1299
7 P.P. (1882)L (Letter of 21 December 1881)
8 Ibid. (Letter of 31 January 1882)

passing of the Education Act of 1902.[1] The case gives an insight into the methods which could be used by unscrupulous teachers. At best, Goffin was a crammer. At worst, he was a criminal. In either case, some of the worst features of the system were revealed. At the time that the Select Committee announced its decision, The Times,in calling Goffin "one black sheep", said that his exposure reflected "not a little blame both on examiners ... and those responsible for the mechanical conduct of the examination". It added that "temptation was offered ... by the negligence of the Science and Art Department".[2] A teacher who wrote a letter at the time urged an enquiry into the system which was so open to fraud,[3] and another wanted a permanent tribunal to hear such cases as that of Goffin.[4] As Lord George Hamilton said in 1881, "Upon the faithful fulfilment of duties depends the whole system of examinations".[5] "Payment by results in itself is almost a bribe, by its temptation of nearly doubling salaries", Waterlow, Goffin's Chairman of Governors, said on that occasion.[6] Another member argued that "the crammer ... can predict questions .. by discovering the examiners and their antecedents. Men of distinction are sure to have fads ... having arrived at original views, they cannot for the life of them help asking questions on them year after year".[7]

It is difficult to understand why the Department allowed Goffin to go on for so long. His defence to the 1865 charge was that he and his pupils had used "common examples from many text-books", and on this first occasion the plea of innocence was accepted. On subsequent occasions,as has been shown, payments were withheld, but no further action was taken. It may have been that the only charges which could be proved were those of "cram". On a legal point, it is difficult to see why Goffin did not prosecute the Department for libel on the Circular printed in the 37th Report, although a plea of privilege might have been entered. Conversely, Donnelly could have brought an action against Goffin for his allegations of falsification in his letter to The Times. It is probable that by this time both political chiefs and officials were tired of the whole business. The case cannot have helped the Department's reputation, but it did lead to a tightening up of security regulations.

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1 Asher Trop The School Teachers (London Heinemann 1957) 122
2 The Times 6 August 1879
3 Ibid. 12 August 1879
4 Ibid. 15 August 1879
5 Hd. CCLXIV (1881) 1267
6 Ibid. 1285
7 Ibid. 1297 (F.H.O'Donnell)

i) Appreciation of the teachers

References have been made in various parts of the work to the Department's tributes to the ways in which teachers co-operated to make its schemes a success. Public appreciation seems to have been limited. The case of a former factory hand, whose further education was based on the help he had received from his evening class teacher, was quoted with approval,[1] but this kind of tribute seems to have been rare. "Teachers with an array ... of certificates, embracing subjects almost comical in their variety:[2] "miserable attempts at teaching":[3] the need for "fully competent teachers ... of a far higher standard than those produced by the Department":[4] "the highly paid schoolmasters from South Kensington";[5] were more usual comments. The Engineer charged the Department with the responsibility for a situation in which the country was "densely populated with teachers of every science under the sun ... they cannot dig and they are ashamed to beg".[6] The British Association's Elementary Science Teaching Committee held the Department to be jointly at fault, with the Education Department, for "the old formal system still firmly engraved on the teachers' minds".[7] "A Department certificate is not necessarily a qualification to teach Science in accord with modern views," it charged four years later.[8] H.G.Wells made the hero's father a Department "crammer" in one of his later novels, and painted a bad picture of his methods.[9] Despite these views, it cannot be disputed that the teachers, who were a vital part of the Department's scheme, played their part most manfully.

C) Elementary school teachers

The teaching of drawing in elementary schools, and much of the teaching in the evening science classes, was carried on by teachers who had been initially certificated by the Education Department. The Department therefore attempted to influence the development of courses in the Training Colleges, and also encouraged the provision of facilities in its "own" Schools, so that such teachers would be able to aid in its schemes.

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1 Nat. 2 December 1869 (Roscoe)
2 Br. Assn. Report 1879 (J.F.Moss, Clerk to the Sheffield School Board)
3 Engr. 28 September 1888 (J.W.Tonks)
4 Engg. 18 October 1889
5 Engr. 25 December 1885
6 Ibid. 27 October 1893
7 Br. Assn. Report 1895
8 Br. Assn. Report 1899
9 H.G.Wells The New Machiavelli [London Benn (Essex Edition) 1926] 24-29

a) The teaching of drawing

Courses for teachers, at the Central School, and in provincial Schools of Art, were provided from the Department's foundation. A special Saturday morning class, taught by J.C. Robinson, in 1853[1], was succeeded by an evening course in 1854.[2] Half-fees were allowed to teachers who attended provincial Schools.[3] Drawing was "more or less taught" in the Training Schools, said the Education Department, and the Department saw them as "the best point for the most effective impetus".[4] A scheme of examination which would give elementary teachers the additional qualification to teach drawing was instituted, with the approval of the primary Department.[5] There was, initially, "often not the smallest degree of instruction, or common apprehension of the subject".[6] While some improvement, and an increase in teachers who were qualifying, could be reported,[7] there seems to have been relatively little progress in early years.

The concentration on "basic subjects" required by the Revised Code of 1862 struck a major blow at drawing in Elementary Schools, as has been recorded,[8] and teachers in general ceased to attend evening classes.[9] There was, however, a recovery when the Department gave increased payments on the subject. Instruction in Training Colleges was encouraged by additional payments to lecturers in 1868.[10] Annual Reports show a general improvement to the point where every Training College taught Drawing, and this association continued until the final transfer of the subject to the Education Department at the very end of the period. When Drawing became a "compulsory" subject, older teachers petitioned for a "length of service" qualification, and this was granted.[11]

b) The teaching of Science

Before 1859, the Department had hoped for "an increased study of the Science of observation" in the Training Colleges.[12] Despite the general lack of co-operation from the Education Department, it continued its attempts to influence the teaching of science in the Colleges. It was believed that they

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1 D.P.A. 1st Report 6
2 D.S.A. 1st Report xxiii
3 Ibid. 345
4 D.P.A. 1st Report 80
5 D.S.A. 1st Report lxi
6 Ibid. 99
7 D.S.A. 3rd Report xxx
8 Chapter VIII Section (c) (ii)
9 S.C.S.A. A. 1954 (Davidson) A.966 (Sparkes) A.1513 (Brewtnall)
10 D.S.A. 16th Report 47
11 D.S.A. 41st Report xxv
12 D.S.A. 4th Report xxxi

could be "made fit for ... instruction with only moderate assistance",[1] even though the Revised Code initially gave little scope for scientific instruction in the schools,[2] and grants of payments on results were made in the usual way. The Royal Commission on Scientific Instruction believed that the quality of elementary school instruction was improving as a result of the Department's attentions,[3] to which several witnesses paid tribute.[4] The granting of extra marks in the certificate examination, by the Education Department, for results in science subjects, met with the Department's approval[5], and as a return gesture, no doubt, an elementary teacher's certificate was accepted as a qualification to earn payments on results in Stage I Mathematics.[6] By 1875, all the men's Colleges were in receipt of grants, and 22 Colleges received over £100 in payments, of 96 institutions in all who received this amount, in 1875-1876.[7]

A real advance was made in 1878, when the Education Department approved a special examination for Training Colleges. Not more than two subjects were allowed to a student, with only one to women, and successful teachers became qualified to earn payments on results.[8] The subjects of examination, which were mainly in the natural and physical sciences, were agreed with the Education Department.[9] The first examination was "like a field of battle strewn with slain".[10] However, the "scientific training in the Colleges" was "still very defective", The Technical Instruction Commission implied that this was due to a "divided responsibility",[11] which is indicated by the remarks of the Education Department's Chief Inspector of Training Colleges. "I am the only Inspector as far as I am aware", he said, and he added that the examination was "merely a paper one". While he believed that the Department's examiners "seemed competent", and he encouraged lecturers to attend its Summer courses, he seems to have wanted sole responsibility for his Department.[12] Inspection had "not been thorough of late", Abney admitted, but he claimed that laboratories were visited.[13] General improvement was recorded in Examiners' Reports from that point. The most popular subjects were consistently

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1 S.C.S.I. A. 179 (Cole)
2 Ibid. A.190 (Cole) and A. 7944 (Cromwell)
3 R.C.S.I. xx
4 S.C.S.I. AA.3987 and 4015 (Cromwell) R.C.S.I. AA. 7910 and 7940 (Cromwell) A.8033 (Rigg) AA. 8102-8105 (Unwin) AA 8177 and 8182 (Bourne)
5 D.S.A. 19th Report 54
6 Ibid. 11
7 D.S.A. 24th Report 227
8 D.S.A. 25th Report 4
9 R.C.T.I. A. 3576 (Donnelly)
10 Ibid. A. 3019 (Huxley)
11 Ibid, 526
12 Ibid. AA. 3497-3522 (Sharpe)
13 Ibid. AA. 3023-3025

Physiography, Animal Physiology, and Magnetism and Electricity: the lack of laboratory facilities probably hindered developments in other fields.

Local School Boards played their part by encouraging their teachers to follow "Department" classes and to gain its certificates. Liverpool, London and Birmingham did this,[1] and London also gave an annual payment of £5 to teachers who held three certificates. This was seen by one H.M.I. as "encouraging them to take the easiest examinations ... as a result, there is much Agriculture in Lambeth".[2] Pupil-teachers also took the examinations before they entered Colleges. The Chief Inspector claimed that this led to much "certificate grabbing",[3] and "very few passed in the most difficult subjects," said the Education Department in its 1888 Report.[4]

Practical instruction in the Training Colleges was made obligatory in 1888, and studies had to extend right through the course. The "Directory" syllabuses of work were followed, but students had to pass at a higher standard.[5] There was "still much room for improvement" in 1893, when "much science" was "bookish," and there were "still too few proper laboratories".[6] "I will show you the experiments next time," was a phrase heard in classes which "revealed the low standard of work in Training Colleges" in 1894.[7] In an attempt to bring about improvement, "method questions" which had, theoretically, been part of the special scheme since its outset, were made a compulsory part of the examination in 1895.[8]

It cannot be argued that the Department was very successful in its attempts to encourage the study either of Science or of Art in the Colleges, but it was, presumably, satisfied when the teachers qualified themselves by gaining its certificates which entitled them to earn payments on classes held out of school hours. The failure of the attempts to influence the teaching in the day schools was but another example of the consequences of the division of responsibility between the two Departments.

D) General relationships with teachers

The Department's relations with teachers, it might be claimed, were generally good, with the exception of the period in the second decade of its

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1 Br. Assn. Report 1883 (Carpenter)
2 R.C.T.I. A. 3766 (Fitch)
3 Ibid. A. 3481 (Sharpe)
4 Nat. 11 October 1888
5 D.S.A. 36th Report iii
6 D.S.A. 41st Report 38
7 D.S.A. 42nd Report 25
8 D.S.A. 44th Report 27

existence,when the Art teachers felt that they had been particularly badly treated. As has been seen, one consequence was the end of the summer conferences held at South Kensington. In general, the teachers appear to have accepted the system because they valued the extra income that they received. There are comparatively few incidents of concerted action against the Department's regulations,although it must be admitted that unions of teachers were, for most of the period, the exception rather than the rule.

The Department welcomed the formation of an "Association of Science Masters" in "1864 or 1865",and on its recommendation revised syllabuses and recommended text-books . (This "Association ... never recommended a return to the old system of payments")[1]. A Manchester Science Teachers' Association was in existence in 1870.[2] A National Association of Science and Art Teachers was projected in 1883[3]: conferences were held in 1887[4] from which it finally developed.[5] (A critic of the Department's "red-tape" at one of its first meetings was assailed by a teacher who said that he "owed to it all I have".[6])

The Manchester Association seems to have been the most firmly founded.[7] It was "not strongly against regulations" in 1888,[8] and communicated with the Department on standards of examination in 1891.[9] A London Association was formed in 1892.[10] (While it queried the L.C.C.'s regulations[11], it does not seem to have had dealings with the Department.) There was also an Association of Headmasters of Higher Grade and Organised Science Schools.[12] The part played in the Goffin case by the fledgling N.U.T. has been recorded,[13] and the evidence of its representatives to the Secondary Education Commission,[14] and of its members in the House[15], were never particularly complimentary to the Department.

In general, however, the teachers of Science and Art classes do not often appear to have spoken as a body during the Department's period of existence. This could suggest, on the one hand, that the teachers, engaged as they often were in scattered, small classes, lacked a feeling of professional solidarity, or, on the other hand, that they found its conditions, in general, satisfactory.

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1 S.C.S.I. AA. 544-547 (Cole)
2 Nat. 6 January 1870
3 Ibid.20 December 1883
4 S. and A. October 1887
5 Ibid. January 1888
6 Ibid. May 1888
7 Nat. 30 July 1885
8 S. and A. December 1888
9 Ibid. February 1891
10 Ibid. February 1892
11 Ibid. May 1892, January 1893
12 R.C.S.E. A. 8236
13 Section B (h)
14 R.C.S.E. AA. 8172-8176
15 Chapter XIII section (d)

CHAPTER TWELVE

STUDENTS, SCHOLARSHIPS AND TEXT-BOOKS

a) Sources of students

i) The artisans

ii) The middle-classes

iii) School children

iv) "Private" students

b) Fees

c) Means of encouragement

i) The Prize system

ii) "Department" Scholarships and Exhibitions

d) The Whitworth Scholarships

i) The inception of the scheme

ii) The "practical" examination

iii) Later amendments

iv) Student reactions, and effects on careers

e) Student attitudes

i) The course requirements

ii) Examinations

iii) General views

iv) Full-time students

f) The subsequent careers of students

g) Text-books

i) "Approved works"

ii) Books by Department officers

iii) Books specially written for examinations

iv) "Text-book teaching"

a) Sources of students

i) The artisans

The proviso that Department aid was to be restricted to those people who were unable to pay for instruction does not appear to have been strictly enforced in the early period, possibly because it was wished to get the schemes going. Cases were, however, recorded of aid being withdrawn for what must have been gross disregard of the instruction.[1] Once schemes seemed more firmly founded, there was more attention to this aspect. The "artisan class", to which aid was to be limited, was defined as that whose members "earned a living by ... manual labour ... or were in receipt of weekly wages".[2] A more precise definition, of a £100 income limit, was first suggested by Donnelly in 1862,[3] and was eventually adopted. The non-employed student's position was decided by parental status.[4] Local Committees were to "satisfy themselves on status". The proportions were now "fairly well known" and "there would have to be several parties to palming off".[5] The clause was "generally leniently administered," but if any student tried to "defraud ... we look sharply after him," Cole said.[6]

The provision met with opposition from the Schools. "No enquiry into status" was made by Sparkes, because he believed that it was "impossible to define an artisan when many clerks earn less".[7] Non-artisans were in any case paying higher taxes and fees, and often made subscriptions, it was argued,[8] and the rule was "unjust, and also immoral because of the temptation it provided for evasion".[9] Status was "not examined exactly" by the Bristol School.[10] Committees found it "invidious" to make distinctions, and "did not make numerous applications on the question," Donnelly said. He attempted to have the clause removed "on several occasions ... because it would enormously simplify administration ... the annual limit of £100 earnings is easy to apply with most students but very difficult with others," he told the Scientific Instruction Commission.[11] Members of the "shop-keeping class" qualified as

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1 S.C.S.A. Appendix 335 and D.S.A. 10th Report viii
2 D.S.A. 13th Report 23-27
3 MS.M 14.136
4 S.C.S.I. A. 6173 (Donnelly)
5 Ibid. A. 223 (Cole)
6 Ibid. AA. 49 and 9 (Cole)
7 S.C.S.A. A. 1394
8 S.C.S.I. A. 5048 (Sales) and R.C.S.I. A. 6311 (Miall)
9 SCSI. AA. 5160-5163 (Watts)
10 R.C.S.I. A. 6382 (Coomber)
11 Ibid. AA. 6445-6455

"artisans".[1] The earnings limit was raised to £200 in 1873,[2] and to £500 in 1893[3], the latter figure being the limit for income tax at that time. It was still applied in 1895 to the Organised Science Schools, where there was likely to be particular opposition to "free" education from the endowed and private schools: statements on parental income were "rarely incorrect" but were sometimes "checked against rateable values".[4] By that time, as figures show,[5] only a very small proportion of students fell outside this category. Since the "Whisky Money" was applied without distinction of class, the clause could well have been abolished.

The "artisan" section always formed a lower proportion of the students in the Art Schools, since the "middle class" fees provided much of their support, but there was a gradual increase in the "artisan" figures there, as the schemes developed. In Art teaching, the artisans seem to have been regarded in many quarters almost as if they were an inferior order of society. It was alleged that they lacked interest, were only with difficulty persuaded into "non-useful activities", and found it difficult to gain the prizes on which teachers' remuneration depended.[6] These charges were refuted by officials of the Department.[7] There was no charity in artisan aid, believed a gunsmith. The "working classes" were less able to help themselves, and it was a government function to provide facilities, he argued.[8]

One scheme which set out to aid "genuine artisans" was that of classes at the Royal Victoria Hall, London, where there were entry fees of 1/- and sessional fees of 1/6.[9] "Saturday variety" was offered to those who joined the classes:[10] from the Hall there developed Morley College and the "Old Vic".[11]

Employers, or "trade organisations", were urged to make up wages, and the former to make further studies a condition of employment, by the Technical Instruction Commission.[12] Afternoon release was advised, as "students are much

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1 R.C.T.I. A. 415 (Curzon)
2 D.S.A. 20th Report 1
3 R.C.S.E. 27
4 Ibid. A. 1050 (G. Redgrave)
5 Table XL
6 S.C.S.A. AA. 797-802 and 1033-1034 (Sparkes), A. 1489 (Brewtnall), A.2266 (Potter), A. 2545 (Murray), A. 3094 (Brenan). R.C.S.I. A. 6300 (Miall) Ath. 31 March 1865
7 S.C.S.A. A. 4254 (Bowler) S.C.S.I. A. 8224 (J.C.Buckmaster)
8 Ibid. A. 6586 (Hibbs)
9 Nat. 23 September 1886
10 Ibid. 13 February 1890
11 Dennis Richards Offspring of the Vic (London Routledge and Kegan Paul 1958)
12 R.C.T.I. 538

too tired in the evenings".[1] Donnelly attempted to point out the advantages of the "sandwich course" idea,[2] which had been used in the School of Naval Architecture.[3] It was argued that this was now fairly common practice in Japan[4], but when it was attempted at Bristol University College it was described as "a curious experiment".[5] While at least one employer did give a designer half-pay while he attended classes[6], the attitude of many employers of the time is perhaps summed up by the comment of a Middlesbrough manufacturer in 1871. It would not pay to allow apprentices to attend day-time classes, he believed, "because they would receive their wages ... and would not really value the instruction they received as if they had the desire for it strong enough to prompt him (sic) to attend classes out of working hours"[7]. "Day release" did not become a very marked feature until the period between the two World Wars, and was never generally accepted until after 1945. There must have been many artisans who walked six to eight miles to attend evening classes after a long working day[8], and their uncomplaining attitude is, therefore, all the more creditable.

ii) The middle classes

It has been noted in several sections of the work that the absence of "middle class" support was one of the obstacles to the development of science classes, but that this aid was a feature in the development of the Art classes. There was, in theory, "a test of competency" before entry to the Art classes.[9] "A mischievous tendency to concentrate on the middle classes" was noted, with the full application of payment on results. "They want an improper mode of teaching ... they do not like the test of accuracy ... the teacher does things he would not be permitted to do with artisans".[10] Such students were "content simply to copy, and do not follow the full course. Teachers say that such students would leave if forced to comply".[11] Their presence was, however, necessary as part of the scheme for the elevation of national "taste",[12] as well as for the fees they provided, and the extension to them of the award of medals was one device used to encourage their attendance.[13] A School of Art

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1 R.C.T.I. A. 2096 (Solly)
2 Nat. 3 March 1887 and R.C.T.I. A. 3595
3 Chapter VII Section (b)
4 R.C.T.I. A. 1480 (Ayrton)
5 Engr. 12 July 1878
6 R.C.T.I. A. 1234 (Sparkes)
7 MS Minutes Middlesbrough Mechanics' Institute 20 January 1871
8 S.C.S.I. A. 7511 (Macadam)
9 MS.M 5.118
10 S.C.S.I. AA. 349-351 (Cole)
11 D.S.A. 20th Report 43 (Wylde)
12 S.C.S.A. AA. 1539 (Brewtnall) and 4321 (Cole)
13 Ibid. A. 493 (Cole)

had to be sited where it would attract middle-class students,[1] and at least one institution closed because its site was too distant from the residential areas of a developing town.[2]

It was "expedient for the state to aid the encouragement of Science without respect to class", Cole argued.[3] Only 13% of the science students in 1868 came from the middle classes, however.[4] (At least one school charged increased fees when they did attend.[5]) Cole "talked with officials of the Treasury on middle class science" late in 1867,[6] and noted the following year that "Playfair advocated science for the middle classes".[7] "The middle classes must rouse themselves from their lethargic contentment with the smatterings of a classical education", the Department thundered.[8] (It has been noted that Cole doubted the value of Charterhouse because of his dislike of its curriculum[9], and he employed private tutors, one of whom was Iselin, for his sons' "Chemistry" lessons).

The Department was restricted in its developments in this field. It had to rely on the "liberalising" of the curriculum in the Public Schools,[10] in increasing its aid to the Endowed Schools, and, by a gradual relaxation of the "artisan clause", aiding the development of the Organised Science Schools. The relatively greater aid given to Science than to Art will be noted.

iii) School children

As late as 1873, 22% of students entered for Science examinations were aged 13 or less, and five children aged 8, and thirty four aged 9, were successful in the examinations.[11] Children attended evening classes to the end of the period, but the growth of the Organised Science Schools meant that increasing numbers received day class instruction in the last decade of the century. There was a complaint in 1897[12] that examinations clashed with the "Jubilee holiday", and they were postponed as a result.[13]

iv) "Private" Students

There was no insistence that attendance at Science classes was a condition of examination, but no payments were made on "private" students. As classes

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1 S.C.S.A. A. 2267 (Potter)
2 MS Minutes Middlesbrough Mechanics' Institute 1896
3 S.C.S.I. A. 291
4 Ibid. Appendix XI
5 R.C.S.I. A. 8903 (Jarmain)
6 Cole MS Diary 27 December 1867
7 Ibid. 13 December 1868
8 D.S.A. 16th Report 58
9 Chapter Four Section (j)(ii)
10 P.P. (1867) XXXVI et seq. (The "Taunton" Commission)
11 R.C.S.I. xxiv
12 Hd. XLVII (1897) 1325
13 Hd. XLVIII (1897) 936

became more freely available, there was a gradual decline in their proportions.[1] "Courses" provided in periodicals, and individual requests for help with difficult points[2], were a continuing feature of the period. Correspondence courses were also advertised to help such students in their preparation.[3] The Honours examinations, for which tuition would rarely be available in more remote districts, and the Scholarship schemes, which encouraged "special" study, ensured that "private" students continued to exist even when classes were more generally accessible.

b) Fees

Cole was a particularly firm believer that students would only value what they paid for, but he also thought that fees should be within the limits of what the poorer students could afford. Fees, he felt, "should be as low as is consistent with eventual self-support"[4], but children in elementary schools should pay at least a penny a week for their drawing lessons. He admitted that many evening students could afford to pay higher fees,[5] in reply to a critic who had made this point.[6] There was less insistence on fees in Science Schools in the early days, when they were attempting to attract students. In 1873 there was, however, a threat to with-hold payments where fees were not paid, with the warning that "gratuitous instruction" would be "only permitted exceptionally".[7] The result was a rapid increase in the proportion of schools in which fees were charged.[8]

Witnesses before the Technical Instruction Commission argued that there was too much insistence on the necessity for fees to make the students value their studies,[9] and despite the views of others who believed that the Department was correct in its policy,[10] the Commissioners agreed with this view.[11] Calculations based on the Department's own figures show a gradual reduction in the fees charged to Art students, with a slight increase in Science fees. The latter never reached the average of the Art fees, and the Departmental aid per capita was always higher for Science than for Art, a consequence of the "middle class" nature of the latter field.[12]

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1 Table XLI
2 e.g., Nat. 20 November 1873 and S. and A. February 1890
3 e.g. St. M. November 1877 and January 1878
4 MS.M 1.270
5 S.C.S.A. AA. 492 and 4321
6 Ibid. A. 680 (Rev. R. Gregory)
7 D.S.A. 20th Report ix and 9
8 Table XLII
9 R.C.T.I. A. 2081 (Legros) A. 907 (Arnoux)
10 Ibid. A.958 (Wedgwood) A.1238 (Sparkes) A.3121 (Abney)
11 Ibid. 522
12 Table II

c) Means of encouragement

i) The Prize system

The "prize" system appears to have been a general feature of the Victorian period, in which the virtue of self-help as its own reward was consistently preached, while such material inducements were also offered, not only by the Department, but in military academies[1] and by such bodies as the Society of Arts and the City and Guilds Movement. (Playfair's introduction of a "medal" scheme at Edinburgh has also been recorded.[2]) The Department's inducements of certificates, medals (including Gold medals for very distinguished students), money prizes, and awards of "drawing instruments" to elementary school children, met with a mixed reception. Employers gave preference to students who had distinguished themselves in examinations, claimed Cole.[3] He defended awards given to the middle class students as "inducement of taste as consumers", and as a tangible return for the fees they paid.[4] He said that there had been great opposition to a suggestion that medals should be replaced by book prizes,[5] in answer to critics who charged that students disliked prize-givings[6] and that medals were little valued and were often not claimed.[7] The award of minor medals was, however, discontinued from 1877.[8] The prizes, which were awarded on "First class" passes in Elementary as well as at Advanced Level, to the disgruntlement of one student,[9] were gradually withdrawn from 1883, and the funds used to aid the creation of scholarships.

The certificates appear to have been generally valued. They were seen as "a valuable possession for the artisan".[10] "A certificate hung up at home" was regarded as "the best advertisement for a school",[11] although "merely being framed and glazed" was all that happened to many of them, in H.G.Wells' belief.[12] When the format was changed in 1897, there were objections that "a shoddy piece of cardboard has been substituted for a presentable certificate".[13] The facts that "private" students entered for the examinations, and that the examinations continued until the First World War,[14] would suggest that they were welcomed by students as proof of personal application and progress.

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1 Chapter XVII Section (c)
2 Chapter Two Section (b)(iii)
3 R.C.S.I. A.18
4 S.C.S.I. A.282
5 S.C.S.A. A. 3886
6 Ibid. A.2609 (C.H.Wilson)
7 Ibid. A.3886 (Hollins)
8 D.S.A. 24th Report
9 Engr. 26 September and 14 October 1870
10 R.C.S.I. A. 814 (Richardson)
11 R.C.T.I. A. 1678 (Place)
12 Nat. 15 November 1894
13 Engr. 23 July 1897
14 Selby Bigge op. cit. 140

ii) "Department" Scholarships and Exhibitions

In December 1867, as one of the first fruits of the movement for Technical Education, the Department introduced a scheme of scholarships which involved "local exertion". They were designed to maintain pupils at elementary or higher institutions,and thus to "compete with the labour market and keep a boy at school".[1] Despite Cole's later statement, that he believed that they should be awarded irrespective of class,[2] all holders had to be "artisans or poor students" as defined by the Directory, and had to pass the May examinations. For the "Elementary School Scholarships" the Department provided an annual £5, and the locality £5, for each of three years. The "Science and Art Scholarships" provided £10, with a local sum of £10, for more advanced work, for up to three years, and "Local Exhibitions" at £25 from the Department and £25 from the locality, were designed to maintain a student at an "Advanced Science School" for one, two or three years.[3] There was a gradual growth in the awards of the first two types of scholarship for the rest of the period.[4] The Royal Commission on Technical Instruction urged "the liberal foundation of scholarships" especially for pupils in "higher elementary schools".[5] From 1880 the Department noted that School Boards were giving good aid in the provision of the local contribution,[6] as a means of maintenance at the Organised Science Schools which developed during this time.

In 1880 the Department introduced a scheme of Royal Exhibitions to the Central Science School and the Dublin College of Science[7], and, in 1883, a system of National Scholarships was instituted.[8] Seven of the former (three to Dublin and four to London) and twelve, later fourteen, of the latter, were awarded annually to the end of the period, in addition to the scholarships given to intending teachers at the Central Science and Art Schools. In 1886, the rules were revised so that there was no longer a distinction between the "Elementary" and the "Science and Art" scholarships. They would in future be known as "Science and Art Scholarships" (as the need to encourage elementary school attendance was now, presumably, a thing of the past). While the local contribution remained unchanged, the Department's contribution was to be £4, £7

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1 S.C.S.I. A. 199 (Cole)
2 R.C.S.I. A. 121
3 D.S.A. 15th Report vii and 2
4 Table XLVI Appendix
5 R.C.T.I. 538
6 D.S.A. 28th Report x and 30th Report x
7 D.S.A. 28th Report x
8 D.S.A. 31st Report xi

and £10 in successive years. In the same year, Local Exhibitions could be awarded for Art as well as for Science.[1] While the complaint was made that the Directory did not give enough information on Scholarships,[2] it was noted by the Department in 1890 that there had been 254 competitors for six Science and Art Scholarships in Birmingham, and 234 competitors for five Scholarships in Cardiff. One holder of an Exhibition became a Demonstrator in University laboratories, and another graduated as Senior Wrangler.[3] (Norman Birkett entered Barrow Higher Grade School on a Science and Art Scholarship.[4]) The numbers of these scholarships awarded ran into the thousands by the end of the century, and they must have formed part of the "scholarship ladder" for untold numbers of professional men.

d) The Whitworth Scholarships

i) The inception of the scheme

A chance meeting between Sir Joseph Whitworth and Cole, in Paris, during the Exhibition of 1867[5], led eventually to the development of one of the most important schemes with which the Department was connected. Whitworth's own formal studies had been of short duration, but he had become one of the most important engineers and industrialists of his day.[6] "Whitworth called and asked me to prepare a scheme", Cole recorded later that year.[7] "Bursarships by competition, holders to study anywhere, for genius rather than scholarship", were discussed by Cole and Donnelly on Boxing Day.[8] Cole and Whitworth were soon "scheming after dinner".[9] A letter was drafted to Disraeli, the Prime Minister, to propose the foundation of "scholarships for Science ... in open competition ... for promoting the study of Mechanics and cognate sciences".[10] After a meeting at which Donnelly was present, and which lasted three hours and ended at 12.45 a.m., Whitworth himself delivered the letter to Disraeli's Private Secretary.[11]

The scheme was given a surprisingly "cool reception" by Marlborough, the Lord President.[12] A letter to the Universities was altered by him "because it named Whitworth instead of My Lords".[13] The "Universities" were, however,

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1 D.S.A. 34th Report xxv
2 S. and A. February 1890
3 D.S.A. 38th Report xxii
4 H. Montgomery Hyde Life of Norman Birkett Q.C. (London Hamish Hamilton 1964)13
5 Nat. 27 April 1882 (Obituary of Cole)
6 F.C.Lea Sir Joseph Whitworth, Pioneer of Civil Engineering (London Longmans Green 1946)
7 Cole MS Diary 16 December 1867
8 Ibid. 26 December 1867
9 Cole MS Diary 1 March 1868
10 Ibid. 5 March 1868
11 Ibid. 18 March and 20 March 1868
12 Ibid. 27 March 1868
13 Ibid. 8 May 1868

"all in favour".[1] The Engineer welcomed the scheme "as a great practical step while the government is fencing on Technical Instruction".[2] The scholarships, which could be held at a number of Universities and Colleges, were to be awarded on the results of the Department's May examinations, followed by a practical examination in the use of tools.[3] Although Whitworth "objected to naming the Department because of jealousy;" it was "settled that it must be so".[4] Cole consulted former chiefs and friends. Lowe[5] and Bruce[6] were asked for their views, although they were out of office. Advice was also given by Huxley,[7] and he later visited Manchester with Cole to take part in the practical examinations.[8] Playfair's suggestion that "cram" could be avoided, if two years preparatory work were insisted upon, led to Cole's pencilled comment on his letter "By workmen earning daily bread?"[9]

The Trust Deed was drafted by Cole.[10] The Lord President or "Minister of Public Instruction" would administer the scheme, which would continue in perpetuity, and the "national examinations in science" would decide the awards. "Power to use tools" would be tested, and "successful artisans would be encouraged to study theory".[11] Whitworth invested £100,000 to provide an annual return of £3,000 to support the scheme.[12] (He originally told Cole that he "would put his money in the Electric Telegraph",[13] but Consols were finally chosen.) Whitworth saw his scheme as a means of "bringing Science and Industry into closer relations". He envisaged it as a fore-runner of "a faculty of industry" and "the establishment of Professorships of Mechanical Engineering by the government".[14] While the manufacturer wished to give artisans priority in the scheme, Cole argued that it should be open to all,[15] although, in fact, certain scholarships were reserved for artisans.[16] Both men believed that "practical men" would do best in the scholarship examinations.[17]

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1 Cole MS Diary 18 April 1868
2 Engr. 10 April 1868
3 Cole MS Diary 13 April 1868
4 Ibid. 4 May 1868
5 Ibid. 11 February and 19 April 1868
6 Ibid. 23 February and 3 May 1868
7 Cole MS Diary 11 February 1868
8 Ibid. 25 September 1870
9 MS letter Playfair to Cole 21 May 1868
10 Cole MS Diary 15 June 1868
11 D.S.A. 15th Report 7
12 Lea op. cit. 12
13 Cole MS Diary 5 April 1868
14 D.S.A. 15th Report viii and S.C.S.I. A. 1668
15 Cole MS Diary 8 December 1869
16 D.S.A. 15th Report 7
17 S.C.S.I. AA. 1691 and 387 (Cole) A. 1692 (Whitworth)

ii) The "practical" examination

The examination in "the power to use tools" was the means whereby the donor hoped to give the artisans their opportunity to compete on more equal terms with "students". The question of the relative value to be given to "practical" marks in the overall scheme caused much friction. The first qualifying examination, for £50 exhibitions, was taken as part of the May examinations in 1869. Of 106 candidates, 52 gained a sufficiently high standard to go forward to the practical examinations at Whitworth's Manchester works.[1] Only a selection of the candidates were to go there, said Whitworth, after details had been settled, but Cole "insisted that all must go".[2] After the practical tests, which involved "smith's work, turning, filing, fitting, pattern making and moulding",[3] Whitworth was "obstinate" when Cole insisted that the awards should go to "the fifty best students even if not workmen".[4] Whitworth "would not give practical marks until the theory marks were divulged". He "at last gave in when I said he could add theory marks for the workmen", noted Cole.[5] Whitworth, however, returned to the topic, and was only silenced when Cole said that Ripon "would never allow theory marks to be divulged".[6] The marks published after the 1870 examinations show the differences between "students" and artisans. The top student, William Garnett, had 1734 marks for theory but only 84 for practice,[7] while the top artisan, Edward Tomkins, an engineering draughtsman, came top of all with 934 and 1534 marks in the respective areas.[8] At least one student believed that a major share of marks was given to practice, and that this "made the whole scheme a lottery".[9]

iii) Later amendments

Whitworth agreed to a "final" scheme, which would control the award of scholarships for five years, in October 1870.[10] When the venue of the practical examination was changed to South Kensington, he again "wished to know theoretical marks".[11] At the time of an illness in 1872, the manufacturer wanted amendments to help artisans,[12] and rules were changed to limit scholarships to adults,

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1 D.S.A. 17th Report ix
2 Cole MS Diary 2 September 1869
3 D.S.A. 16th Report 17
4 Cole MS Diary 27 January, 11, 25 and 26 February 1870
5 Ibid. 3 August 1870
6 Ibid. 31 August 1870
7 He was, however, ill for part of the examination
8 D.S.A. 18th Report 62
9 Engr. 10 June 1870
10 Cole MS Diary 21 October 1870
11 Ibid. 23 June 1871
12 Ibid. 9 August 1872

and, in effect, to artisans, since "two years workshop experience" was now a pre-requisite.[1] There were further changes at Whitworth's request in 1874.[2] These reduced the number of scholarships,but gave greater rewards to successful candidates by means of a "bonus scheme".[3] In 1878 the regulations were altered once again, after more criticisms by Whitworth,[4] to require passes in specified subjects, and there was an added "practical" requirement. This was the construction of a Whitworth screw, to a tolerance of .001".[5] (This drew a comment from one student,that the six months notice to be given,if this were in fact to be constructed,now only made it necessary to announce the theory questions in advance as well).[6] At the same time, the three year scholarships were changed to one year Exhibitions. All these amendments were designed to meet Whitworth's demands that "artisans" must be given a better opportunity to secure his scholarships.

From the outset of the scheme, Donnelly had been involved. He first opposed the idea of Exhibitions, not Scholarships, in 1868.[7] He was "obstructive about changes" which, in effect, limited the scheme to artisans, in 1873, but was over-ruled.[8] "General stimulation" he felt, was important, and he feared that the "bonus scheme" would "reduce good work and induce the study of subjects for easy marks".[9] (Donnelly's resistance to changes was noted by the Engineer, which said that it had received many letters which supported him).[10] The changes "had driven students out" he said in 1882, but he admitted that they were "designed to benefit artisans and... no longer to produce a highly educated few ... lost to the workshops".[11] The numbers of entrants showed a sharp decline for a period after the scholarships were replaced by Exhibitions.[12]

Donnelly represented the Department at Whitworth's funeral in January 1887.[13] (Nature noted that the industrialist's will which, possibly,included further bequests, had been revoked by codicils in 1886, and his executors were now merely requested to "aid Science and Art".[14] The mis-handling of his further offers of aid after Cole's retirement has been recorded.[15]) In June

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1 D.S.A. 20th Report x
2 Cole MS Diary 13 and 19 May, 5 June 1873
3 D.S.A. 21st Report 27
4 Cole MS Diary 12 May 1875 and 24 November 1878
5 D.S.A. 28th Report 12-13
6 Engr. 24 September 1878
7 Cole MS Diary 13 April 1868
8 Ibid. 24 July 1873
9 D.S.A. 21st Report 27
10 Engr. 27 November 1874
11 R.C.T.I. A. 3954
12 Table XLVIII
13 P.M. W.S. 5799
14 Nat. 17 March 1887
15 Chapter Four, Section (b)(iii)

1887 his executors transferred the £100,000 in 3% Consols, as provided by the original deed.[1] Soon after Whitworth's death, the Department changed the terms of the awards, and combined the one year Exhibitions with three year scholarships which it re-introduced. Awards were to be limited to "persons under 26 who had spent three years in handicrafts".[2] There was a very marked rise in entrants as a result of the new scheme. The figures remained in the region of 100 annually, with a few exceptions, to the end of the period.[3]

iv) Student reactions and effects on careers

Competition for the scholarships grew as the scheme developed. The period of study, and the subjects covered, were gradually extended by the candidates themselves, who were advised in 1883 to "take every subject possible" over a six year course, of five evenings a week, followed by a year of full-time study.[4] (One successful candidate could complain in 1887 that he was "jobless at 24", after "three years full-time study"[5]) A 14½ year old foundry worker, who asked for advice on a course of study in 1890, was tersely advised to "see the Directory".[6] William Garnett, eventually Adviser on Technical Education to the L.C.C., sat for 23 examinations in one year and passed in all, "much to the surprise of the invigilator ... who foretold collapse". He had to retire from the first practical examination after he had "spent the vacation practising", because "competition for other prizes" had rendered him "unfit". He went up to Cambridge in 1869, and next year headed the list, securing a scholarship which "rendered me self-supporting for the rest of my time at Cambridge."[7]

From time to time the Department published details of the subsequent careers of scholarship winners. They included a Second Wrangler, a London D.Sc.,[8] a Principal of a Japanese Engineering College,[9] a Keeper of the Science Collections,[10] a City and Guilds Lecturer,[11] and a Professor at the Normal School of Science, who was "one who had cause to be grateful to South Kensington."[12] Of 143 Scholars, details of whose careers were published in 1886, just on a

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1 Lea op. cit. 15
2 D.S.A. 35th Report XVI and 3-4
3 Table XLVIII
4 "A Whitworth Scholar" Whitworth Scholarships and How to obtain them (London Crosby Lockwood 1883)
5 S. and A. November 1887
6 Ibid. March 1890 (Letter from "Excelsior")
7 D.M.Allen William Garnett: A Memoir (Cambridge Heffer 1933) 12-16
8 D.S.A. 18th Report 55 (Greenhill and Hopkinson)
9 D.S.A. 20th Report 71 and Nat. 3 April 1873 (Dyer)
10 D.S.A. 38th Report xli
11 G. Halliday
12 J. Perry Engr. 4 January 1889 and Nat. 18 January 1889

quarter became teachers.[1] (By 1925, this proportion had fallen to 16%,[2] and by 1955, had risen to almost a quarter once more.[3]) (The fact that many "were not good ones" was advanced as an argument for a teaching examination.[4]) Criticisms could be voiced that some of the Scholars were "very conceited men ... who become totally dissatisfied with their ordinary work ... and prove to be practical failures ... who prejudice practical men against Technical Instruction".[5]

Whitworth's desire to increase the artisans' opportunities by changes in the regulations proved to be successful. Of the holders of Scholarships and Exhibitions,whose occupations were shown in the lists published annually to 1893, the very great majority came from industrial occupations.[6] Whitworth had originally wished to give preference to artisans from his own North and Midlands.[7] There was no such preference in the scheme, but the figures to 1893 show that these areas supplied over half of the successful candidates.[8] (By 1925, the proportion had fallen to one third.[9]) The scheme was certainly one of the most successful in the Department's history. It continued to produce men whose influence on industry (and Technical Education) must be incalculable, and the letters "Wh. Sch" are still seen as an accolade. It is but another example of a way in which Cole was able to use a personal friendship for the eventual benefit of his Department and of technical education.

e) Student attitudes

i) The course requirements

The major criticisms of courses encouraged by the Department came in the early days of the Art courses. "Excellence in Art demands a great deal of elbow grease", said Cole, quoting his artist friend Mulready, in refutation of a general charge, later made more specific, that students were "depressed by the works to be executed".[10] This charge was made by C.H.Wilson, who argued for better motivation by a connection with local industry.[11] (This plea was to some extent reduced in its effect by the fact that twelve years earlier it had

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1 Table L
2 ed. D.A.Low The Whitworth Book (London Longmans Green 1926) 25
3 H.H. Johnson and F.T.Barwell The Whitworth Register (London The Whitworth Society) 22
4 R.C.T.I. AA. 624-625 (Reynolds)
5 Ibid. AA. 619-623 and 626 (Reynolds and Gee)
6 Table XLIX
7 Cole MS Diary 1 March 1868
8 Table XLVII
9 D.A.Low op. cit. 30
10 S.C.S.A. A. 264
11 Ibid. AA. 2664 and 2729

been noted that Wilson was the only teacher who resisted any developments in the "technical" field.[1]) Mechanical and Engineering Drawing were the most popular "Art" subjects with artisans, because they could see that they had practical applications[2]: in other work there were complaints that they were depressed because of "having to go through the same exercises year after year"[3]. Complaints on this score became fewer as courses developed on more "applied" lines.

ii) Examinations

Evening examinations were not always welcomed. Saturday examinations were suggested,"because students become exhausted after two or three evening examinations,one after the other".[4] "May is one of the pleasantest times for evening occupations" wrote a student, who talked of "three hours evening fatigue".[5] (Evening examinations continue to be a feature to the present day, of course). Nor were premises always satisfactory. Board Schools were "not over-pleasant places",[6] and there was an indignant complaint when a student "caught a flea" in one[7]. The fact that schools were used for other activities provided another hazard. A concert was held during one examination[8], and there was "hardly an institution where Music is not a nuisance".[9]

iii) General views

Numbers would not,of course,have continued to increase if students had not valued the instruction. A "carpenter who had improved his position" and "a mason who had become a sculptor" were quoted.[10] All save one manufacturing chemist in the city had been trained at the Bristol Trade School in 1868.[11] In that year, 71 of 114 West Riding Chemistry students believed that their studies had been of value to them in their employment, but only 21 said that they had gained higher wages as a result.[12] In 1882, an "old student earning £1,000 a year,and another working as a designer in Paris" were reported from Nottingham.[13] The voice of women was rarely heard, apart from one complaint

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1 D.P.A. 1st Report 28
2 S.C.S.A. A. 1442 (Sparkes)
3 Ibid. AA. 3096 and 3139 (Brenan)
4 R.C.S.I. A. 1814 (Richardson)
5 S. and A. July 1889
6 Ibid. July 1889
7 Ibid. August 1887
8 Ibid. June 1887
9 Ibid. February 1891
10 S.C.S.A. A. 1488 (Brewtnall)
11 S.C.S.I. A. 3949 (Coomber)
12 Ibid. A. 4452 (Jarmain)
13 R.C.T.I. A. 833 (Rawle)

that examinations in modelling often resulted in the casting of pieces which were too heavy for them to lift.[1] The students were advised to "avoid the dangers of cram", and the student,"being a gentleman", would not "of course, ask his neighbour a question during an examination".[2]

iv) Full-time students

There were few cases of complaint or difficulty from the full-time students of the central Institutions. At the Art School the "arrival of students from Dublin without summons" must have caused some embarrassment in 1854, but their fate is not recorded.[3] Art masters in training were on occasion involved in trouble with the police.[4] A student named Whittaker was dismissed for insubordination, re-appointed after successful teaching, and then dismissed again for "rebellion".[5] A Miss Trulock was appointed Female Superintendent in 1864 to "put down indiscipline" among the women students which followed the move to new premises. "The Misses Walker and Shakespeare" later admitted "whistling to provoke Miss T." and "refusing to come when asked", and were dismissed as an example to the others.[6] There were still cases where the "Art" was put before the course, and a National Design Scholar later said that he had "followed my studies badly ... I desired to be an illustrative artist ... and left, much to the disappointment of Mr. Burchett".[7]

After their maintenance allowance was cut from 30/- to 21/- a week, Science students petitioned for a return to the old sum, but Donnelly said "They knew what they were coming for" and "declined to consider".[8] A Member of Parliament was concerned about the lack of supervision and the cost of accommodation in a non-collegiate institution,[9] but few difficulties seem to have developed. H.G.Wells not only detailed his experiences as a student in his Experiment in Autobiography: his Mr. Lewisham found that his "bluish green certificates" had "value beyond mural decoration", and went to London "to be paid a guinea a week for listening to lectures ... Huxley and then Lockyer".

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1 S. and A. March 1890
2 Ibid. May 1887
3 MS letter Redgrave to Cole 3 October 1854
4 MS letter Lowe to Cole 18 July 1862, and MS letter Playfair to Cole 18 August 1856
5 Cole MS Diary 9 February 1856, 2 and 9 November 1857, and MS.M 5.79-83, 5.154, 7.123, 8.61
6 Cole MS Diary 23 April and 14 May 1864 and MS.M 18.16, 18.89a.
7 S.M. June 1893 (VI.119)(Fildes)
8 Ed. 23 29.58 10497
9 Hd. CCCXLI (1890) 1195 (Rowlands)

His final examination failure there matched that of his creator, but before that, he "licked up paper certificates like a devouring flame", and went down to become a teacher after all.[1]

f) The subsequent careers of students

Many distinguished artists, scientists, and academics owed part of their eventual success to facilities aided by the Department.[2] Of 18 subsequent Fellows of the Royal Society, 16 attended the Central Science Institution in the period in question, and two others were at the School of Naval Architecture, and a provincial Science School, respectively. In Art, the "notables" were those who took up careers which had not been planned by the Department. Of 123 members of the Royal Academy between 1880 and 1930, of whom biographical details are available, five attended Somerset House or provincial Schools of Design, 12 were trained at provincial Schools of Art, and 8 attended the Central School. (Of the 123, 28 attended the Royal Academy Schools at some time, five of them from "Department" Schools). The Lambeth School of Art, in Sparkes' time as Headmaster, or after, produced five eventual R.A.'s, and, in addition, a sculptor particularly admired by Ruskin.[3] Of tan Strand Magazine illustrators in 1895, four had been educated at Schools of Art.[4] The cover of Thackeray's Cornhill Magazine was designed by Godfrey Sykes of the Central School, on Cole's recommendation.[5]

Sidney Gilchrist Thomas, whose discovery of the process which eliminated the great obstacle to the production of steel from high phosphoric ores, was made with rudimentary equipment, in his off-duty time from his work as a Solicitor's clerk, studied for the Department's examinations.[6] G.W.Humpidge, who became a University Professor at Aberystwyth, gained the Department's Gold Medal as a student at the Gloucester School of Science.[7] Edward Small, Director of Technical Classes to the Monmouth County Council, gained a First class Cambridge degree after a year at the Normal School.[8] Six out of 78 men and women listed as "prominent in the Labour Movement" in 1895 had, at one time or another, attended "Department" classes".[9] The influence of such classes

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1 H.G.Wells Love and Mr. Lewisham [London Benn (Essex Edition) 1927] 9,59,192
2 Table XLIII
3 S.M. II January 1891 443-452 (George Tinworth)
4 Ibid. X October 1895 786-790
5 G.W.Ray Thackeray: The Age of Wisdom (1847-1863)(Oxford University Press 1958) 295
6 Lilian Gilchrist Thompson Sidney Gilchrist Thomas (London Faber and Faber 1940) 47, 54-55, 58-59
7 Nat. 15 December 1887
8 S. and A. January 1893
9 ed. Jas. Edwards The Labour Annual 1895 (Manchester Labour Press Society 1895)

on the careers of students who did not eventually attain mention in the reference books cannot, of course, be calculated.

g) Text-books

i) Approved works

The production of text-books expressly for the Department's classes provides a good example of the "laws of supply and demand" which Cole was so fond of quoting, and is conveniently dealt with in this section. A series of works to be issued by the Department through the publishers Chapman and Hall were originally planned[1], but this idea was dropped when Trevelyan of the Treasury said that he would be against such a "printing monopoly".[2] A Circular was then issued,which asked publishers if they would produce books from manuscripts supplied by the Department, which would thus "enable the public to buy them cheaply while creating no monopoly or interfering with private trade".[3] Such "Department inspired" works were produced. "Care was needed when commissioning a text-book", and then "only when there (was) "a marked want", said Donnelly.[4] The Department issued lists of recommended books, although it "did not prescribe them".[5] (Lowe queried the "Department's connection with Science books" soon after he took office.[6]) (One of the masters superannuated in 1864, charged that Donnelly had prepared an "insulting" report on one of his books, and that Cole had refused to include it on the "recommended list" until he made reference to certain models.[7])

ii) Books by Department officers

Many of the Department's lecturers and officers engaged in the preparation of books for this market. The involvement of Cole and Redgrave,[8] and Cole's daughter, Laetitia[9], in the production of drawing text-books have been recorded. J.C. Buckmaster was the most prolific of the officers. The British Museum Catalogue lists fifteen productions from his pen, many of which ran into several editions. (Some of these were on Cookery, in whose promotion he was involved with Cole "outside" the Department). His books were not always appreciated. One of his Chemistry works was "now useful when revised by Mr. Jarmain"![10] many

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1 Cole MS Diary 30 April 1852
2 Ibid. 13 August 1852
3 Ath. 2 October 1852
4 S.C.S.I. A. 515
5 R,C.S.I. A. 6248 (Miall)
6 Cole MS Diary 8 December 1859
7 S.C.S.A. AA. 3800-3803 (Binns)
8 Chapter One Section (d)
9 Chapter Four Section (j)(i)
10 R.C.S.I. A. 6248 (Miall)

of his works were "mere cram", and many by other authors were much better, it was implied.[1]

A Technical Arithmetic by Merrifield was criticised because the student was "not inspired to find methods for himself".[2] An Elementary Freehand Drawing by Wallis and Horsley, former masters, appeared in 1856[3], and Poynter produced a series of South Kensington Drawing Books after his retirement from the Department.[4] The criticisms that Goodeve's examinations were based on his text-books have been noted[5], but, in general, his works received favourable reviews.[6] An Elementary Astronomy was produced by Lockyer[7], and Galloway of Dublin wrote a Chemistry.[8]

Huxley's attempts in the field of Physiography have been noted.[9] He contributed an Introduction, and the work on Biology, to a series of Science Primers, published by Macmillan, which he edited with Roscoe and Balfour Stewart. Other authors in the series who were connected with the Department included Lockyer, Geikie and Foster.[10] "A horrid shillingsworth of cram ... beneath contempt... but selling in enormous numbers", and an attempt by the Society for the Promotion of Christian Knowledge to "pirate" their ideas, was reported to Huxley by Roscoe, who saw "a struggle coming". At the same time he could say that Stewart's Physics had sold 12,000 copies in eighteen months, and predicted that Huxley's own works would be "worth a £100 a year" to him.[11] Donnelly read the proofs of Huxley's Introductory Primer, and promised to send comments.[12]

Teachers connected with the Department who produced books were Muckley, whose Colours was "deficient on Chemistry",[13] and Aveling, whose Natural Philosophy was "a cram book of the worst and weakest type, with a rank crop of blunders".[14] A book of Trignnometry and Mensuration was written by William Garnett, never one to spurn an opportunity.[15] Twisden's Theoretical Mechanics

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1 Nat. 2 February 1871
2 Ibid. 15 February 1872
3 Art J. July 1856
4 S. and A. (Advertisement) July 1887
5 Chapter VI Section (k)
6 Engr. 8 March 1861, 10 March 1871 Nat. 19 May 1886
7 Engr. 25 September 1868
8 Nat. 7 February 1889
9 Chapter VI Section (c)
10 MS letter Roscoe to Huxley 19 October 1871 and advertisement in Nat. 15 May 1884
11 MS letter Roscoe to Huxley 24 January 1875
12 MS letter Donnelly to Huxley 16 September 1879
13 Nat. 19 August 1880
14 Ibid. 20 January 1881
15 Ibid. 15 July 1879

was praised[1], and Valentin's posthumous Inorganic Chemistry received a tribute because it was "based on 'see' and 'perform', not merely 'read'."[2]

iii) Books specially written for examinations

Many authors made little pretence to do other than to prepare for the examinations, and the provision of model answers to previous questions was often quoted as an additional benefit of a work. Thus, Science and Art Drawing by J.H. Spanton "faithfully follows the syllabus"[3], and Practical Geometry Test Papers by G. Grace included spare paper for answers.[4] Practical Geometry for Science and Art Students by Carroll ran through ten editions in eight years, and provided "600 problems and exercises, with solutions to questions set from 1881 to 1886 on a variety of topics".[5] Rankin's Solutions for D.S.A. Examinations 1881-1886 would "save many a heart-ache"[6], and Notes on Building Construction gave the syllabus, rules and former examination questions[7], as did Harrison's Guide to Examinations in Chemistry.[8] Elementary Practical Physics for Organised Science Schools by R.A. Gregory suggested practical experiments[9], and A Treatise on Practical Geometry with D.S.A. solutions was advertised in 1897.[10] The Students Magazine, first published in 1877, promised, and proceeded to give, "papers, lessons and exercises" and "actual answers to Government questions".[11] Science and Art made the same promise and provided the same service from its foundation.[12]

iv) "Text-book teaching"

Nowhere where the "laws of supply and demand" more clearly illustrated than in the field of the Department's "own" subjects of Physiography. From 1882 to 1901, at least thirteen separate text-books were published on this topic.[13] H.G.Wells' own effort in the Biology field was described as

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1 Engr. 12 February 1875
2 Ibid. 8 August 1879
3 Nat. 12 December 1895
4 Ibid. 6 July 1899
5 Engr. 29 November 1889
6 Ibid. 21 March 1890
7 Ibid. 19 August 1892
8 Nat. 11 February 1892
9 Engr. 15 January 1897
10 Ibid. 28 May 1897
11 St.M. January 1877
12 S. and A. April 1887
13 Principles of Physiography Douglas Nat. 3 January 1889: Textbook of Physiography Edward Hall Nat. 14 February 1889: Elements of Physiography (7th Edn) J.J.Prince Engr. 17 January 1890: Advanced Physiography Thornton Nat. 29 May 1890: Physiography & Answers to questions Harrison Nat. 29 October 1891: Laws and wonders of Nature Gregory Nat. 24 November 1892: Elements of Physiography Dickie Nat. 4 May 1893: Elementary Practical Physiography Thornton Nat. 13 January 1895: Physiography for Beginners Simmons Nat. 24 December 1896: Elementary Practical Physiography (Second Edn) Thornton Nat. 13 January 1898: Physiography Davies Engr. 22 April 1898

"including many errors and crude illustrations", and he was advised that he would have "done better to wait and work for a few more years before publishing".[1] He correctly saw the text-book as "a most dangerous piece of apparatus", and believed that "its abuse is as immediate and frequent as that of strong drink",[2] and he later referred in one of his novels to "text-books written simply for the Department's examinations".[3] While the whole operation was called into play by the lack of practical facilities, even when these were developed, only the better training of teachers would in the long run provide a corrective to "text-book teaching". Generations of students must have suffered from this, and it was the examinations system which had called the "cram-books" into being.

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1 Nat. 14 December 1893
2 S. and A. June 1892
3 H.G.Wells The New Machiaevelli [London Benn (Essex Edition) 1926] 29