

1896.
NEW ZEALAND.

EDUCATION: MANUAL AND TECHNICAL INSTRUCTION.

Presented to both Houses of the General Assembly by command of His Excellency.

1. EXTRACT FROM NINETEENTH ANNUAL REPORT OF THE MINISTER OF EDUCATION.

TECHNICAL INSTRUCTION.

The expenditure of the Department for the encouragement of technical instruction in science and art in 1895 was £948 19s. 8d., as follows: Technical Classes Association, Auckland and Dunedin, £100 and £250 respectively; Education Boards of Wellington and Wanganui, £200 each; School of Domestic Instruction, Christchurch, £150; Milton District High School, £7 14s. 5d.; expenses of examination of South Kensington, £20 12s. 9d.; and of City and Guilds of London, £20 12s. 6d.

The following table shows the number of New Zealand candidates examined and passed in 1895 by the Science and Art Department, South Kensington, and by the City and Guilds of London Institute. The candidates were from the technical schools of Wellington and Wanganui, and the Dunedin School of Art. but among the Wellington candidates are included some students of institutions at Masterton, Pahiatua, and Westport, affiliated to the Wellington Technical School.

TABLE Y.—LONDON TECHNICAL EXAMINATIONS, 1895.

					Wellington.		Wanganui.		Dunedin.	
					Candidates.	Passes.	Candidates.	Passes.	Candidates.	Passes.
South Kensington:										
Art—										
Second grade	..	..	..	..	216	142	54	38	209	147
Third	..	..	..	..	45	39	13	6	16	15
Works	..	..	..	..	33	15	10	7	..	..
Science	..	..	..	..	41	24	4	3	27	20
City and Guilds:										
Papers—										
Ordinary grade	..	..	..	..	33	18	..	..	..	..
Honours	..	..	..	..		2	..	..	..	..
Plumber's work—										
Practical examination	..	..	..	..	16	12	..	..	..	..
Total	..	..	..	..	384	252	81	54	252	182

"The Manual and Technical Elementary Instruction Act, 1895," provides for the granting of subsidies to classes established for instruction in such branches of science and art as are encouraged by the South Kensington Department and by the City and Guilds Institute, and also to workshops connected with public schools; and the same Act allows part of the ordinary school time to be given to elementary manual instruction.

A circular was issued in January, 1896, containing information with respect to the development of manual instruction in England; and another is now in the press, being a reprint of that part of the report of the London School Board for 1895 which treats of the same subject.

The annual report on the Goldfields of New Zealand (C.-3), issued by the Department of Mines, will include information with respect to schools of mines; the annual report of the Department of Agriculture will give particulars of the dairy school; and the reports of the University of Otago (E.-6) and Canterbury College (E.-7) will show what is being done by the Medical School and the School of Mines at Dunedin, and by the School of Engineering at Christchurch, and the School of Agriculture at Lincoln.

2. TECHNICAL SCHOOL, WANGANUI.—ART MASTER'S REPORT.

SIR,—

Technical School, Wanganui, 1896.

I have the honour to submit the following report in connection with this school for 1895:—

In my last report I referred at considerable length to the increased accommodation required and the appointment of a competent teacher to assist me in the work. In May, 1895, the Board appointed a committee to consider my application for this enlargement and assistance, the report being as follows: "We find that the school is suffering from lack of accommodation and from inadequate teaching power. Even with the present numbers attending, with the subjects undertaken it is impossible to overtake the work, while urgently-needed extension of the work cannot be thought of till more accommodation and help are provided." In March, 1896, the executive committee of the Board reported with reference to this matter, that "towards the cost of the enlargement and furnishing £619 is available, leaving a deficiency of £200."

I think it is much to be regretted, in the face of the finding of the committee in May, 1895, quoted above, that the Board has not seen its way to proceed with the enlargement of the school, and place it on the same standing as regards its relation to education as the schools at Wellington and Otago. Any deficiency in the income in connection with these two schools is made up solely from the money voted by Parliament for primary-school education. The masters of these schools certainly have duties in connection with the primary schools of the State which amply repay the expenditure, if any be incurred beyond the fees received by these institutions, and the same result would obtain in this district without doubt if this school were put on the same footing.

ATTENDANCE.—The number of students who attended the different classes of this school during the three terms respectively was as follows: Morning class for drawing and painting, 9, 9, 6; evening class, 30, 28, 27, of which 3, 4, 3 were engineering students; Girls' College—Drawing, 58, 57, 58; Girl's College—Painting, 7, 9, 8; Saturday drawing class for primary-school teachers and others, 47, 28, 44; Saturday-afternoon science lectures for primary-school teachers and others, 37, 13, 16: total, 188, 144, 159. The courses of instruction have been the same as in former years, with the addition of science lectures on Saturday afternoon.

As I intimated in my report last year, drawing is now a compulsory subject for pupil-teachers under the Board at their annual examination in June. At the request of Inspector Bindon I conducted the examination. As this was the first year the standard of pass was rather low; several candidates, however, failed to obtain the necessary marks.

At the local annual examination in December for drawing certificates accepted by the Education Department for E the following were the results:—

Freehand	...	...	15 candidates	15 passed	0 failed.
Model	...	...	14 "	9 "	5 "
Geometrical	...	...	10 "	5 "	5 "

At the South Kensington examination held in June the following results were obtained:—

Second Grade.

Freehand	...	40 candidates	11 first class	15 second class	14 failed.
Model	...	6 "	2 "	2 "	2 "
Light and shade	...	6 "	4 "	2 "	0 "
Perspective	...	2 "	1 "	1 "	0 "
Geometrical drawing	...	...	4 candidates	3 passed	1 failed.

Third Grade.

Principles of ornament: First class—Caroline Blair; second class—Madeline Browne; 0 failed. Light and shade: First class—Marianne A. T. Small, William H. T. Partington, James T. Hogan; second class—Fortescue F. C. Huddleston; 0 failed.

School Works sent to South Kensington for Examination.

For Art Master's Certificate.—Flowers and foliage from nature: Accepted—Ethel W. Anderson, Caroline Blair; not accepted, 0.

For Art Class Teacher's Certificate.—Shading from the cast: Accepted—Fred Atkins, Catherine D. Grant, Minnie Jones; not accepted, 0. Outline from the cast: Accepted—Leonard J. Watkins; not accepted, 2. Shading from models: Accepted—Leonard J. Watkins; not accepted, 0.

I have, &c.,

The Chairman, Wanganui Education Board.

DAVID BLAIR.

3. TECHNICAL SCHOOL, WELLINGTON.—REPORT OF THE DIRECTOR.

SIR,—

Wellington, 1st March, 1896.

I have the honour to submit my report upon primary drawing and the work of the Technical School for 1895, as follows:—

Primary Drawing.

The work in connection with the primary schools has been of a satisfactory character throughout the year. I am glad to report that clay-modelling, pattern-drawing, flat tinting, and cardboard work have made a steady advance in a fair number of schools.

MANUAL INSTRUCTION.—The Minister of Education having practically guaranteed pound for pound for the cost of establishing a central class for manual instruction, the workshop at present in use by the school was provided with appliances to accommodate twenty boys. Mr. Barrett was appointed instructor, with Mr. Anderson as assistant. The number of boys present the first quarter was sixty-eight. This number fell in the second quarter to thirty-eight, and in the third to thirty-two, although some of the boys attended the evening class during the last two quarters in preference to the day. As the classes were but a trial, the methods and arrangements were not perfect. Towards the end of the year arrangements were made for special drawing exercises being given to the boys in connection with their woodwork. A series of diagrams have now been prepared, and will be used throughout the classes. Many boys were disappointed, inasmuch as they were expecting at once to make some object; others, again, retired after the newness had worn off. Until the nature of the instruction is understood, steadiness cannot be expected. Much opposition has been encountered from persons who have no understanding of what the aims are, but this will steadily be overcome by the success of those boys who continue at work. There is no idea of teaching a trade in this work. The whole purpose is to cultivate handiness and, at the same time, practical intelligence. It would be absurd to try to teach young children a trade before they have acquired the rudiments of knowledge; but it is equally absurd to confine their early education to book-learning, which gives no training to the eyes or hand. We wish to train the children to be handy and useful. The object of the classes is to teach boys of the upper standards some simple handwork, such as how to use simple tools in working with wood, the work being done from patterns and examples drawn by the boys themselves. I should be glad to see the Liverpool and Manchester method of instruction adopted, the fee being nominal, the boys being instructed in sections throughout the week.

FIRST-GRADE DRAWING EXAMINATION.—In this examination the following were the results: The total number of papers issued was 7,010; and the number worked, 6,384. Subdivision of papers: Freehand, 1,970—1,020 passed, 950 failed; geometry, 2,074—1,442 passed, 632 failed; scale, 1,473—839 passed, 634 failed; model, 867—449 passed, 418 failed: total, 6,384 papers; 3,750 passed, 2,634 failed. Of the above papers, 1,142 were taken by schools not under the Wellington Board, and 634 passes were recorded. Number of papers "excellent," 303; number of papers "good," 706; individual candidates, 4,042; individual passes, 2,864; schools presenting candidates, 101. Increase upon 1894: Papers worked, 907; individual candidates, 455; individual passes, 425.

In the freehand papers, proportion was again one of the main causes of failure, and a large number showed want of appreciation of the character of the figure. There are still a very large number of candidates who ought never to have been presented. The geometrical papers show generally good work, but a more thorough knowledge of the definitions is necessary. The scale papers still give evidence of weakness in a most important point—viz., the construction of the scale. The model papers show steady improvement. There is still a tendency to draw the objects too small.

The number of papers applied for from outside districts was 1,142, almost double the number of last year. The schools were from the Auckland, Greymouth, Marlborough, Nelson, and Wanganui Districts. Several Wellington schools not under the control of the Education Board sent up candidates for examination.

Undoubtedly this examination has done more towards developing a sound basis for technical education than any other primary work. The results speak for themselves in the following return, showing the number of passes recorded since the examination was established: In 1884, 80 passes; in 1888, 600 passes; in 1890, 1,966 passes; in 1892, 2,413 passes; in 1895, 3,750 passes.

The total number of certificates issued from 1884 to 1895 is 19,282. The number of full first-grade certificates (embracing passes in four subjects) issued up to date is 941.

SCHOLARSHIPS.—The work done by the sixty-two scholars holding drawing scholarships has been of a very satisfactory character, and has proved of value to a large number of boys entering the various trades and professions. Over two hundred competed for the fifty vacancies occurring. The papers worked by the scholars competing surpassed in merit all previous years, and show how good and thorough the work in the primary schools is becoming. So excellent were twenty-one of the papers that I unhesitatingly gave second-grade certificates.

INSTRUCTION TO TEACHERS AND PUPIL-TEACHERS has been continued as usual during the year. The classes have made better progress this year, especially so in the case of those holding the full second-grade certificates, who have continued their more advanced studies in light and shade and colour. In the junior Saturday classes greater punctuality is still to be desired, especially in connection with geometry and perspective sections. The correspondence class is considerably extending its usefulness.

Technical School.—Number of Students.

Day classes—	First Quarter.	Second Quarter.	Third Quarter.	Fourth Quarter.
Drawing and painting (whole-day students)	15	18	15	15
Drawing and painting (half-day students)	23	30	30	34
Geometry and perspective	11	11	11	11
Secondary-school scholars	...	45	53	51
Primary-school scholars	58	52	48	46
Teachers and pupil-teachers	107	104	106	100
Wood-carving	11	19	20	14
Manual instruction	...	68	38	32
Evening classes—				
Architectural and building construction ...	23	23	18	19
Mechanical drawing	31	36	32	31
Drawing	99	99	93	88
Life class	4	4	7	5
Practical plumbing	24	19	23	27
Theory of plumbing	15	9	17	21
Wood-carving, carpentry, and modelling ...	9	27	21	17
Applied mechanics	19	15	16	14
Totals	449	579	548	525

The following occupations are represented amongst the students of the evening classes: Engineers, 35; watchmakers, 2; fitters, 2; blacksmiths, 2; joiners, 6; carpenters, 19; carriage-builders, 2; cabinetmaker, 1; plumbers, 37; printer, 1; wood-turners, 2; engraver, 1; clerks, 11; painter, 1; architects' assistants, 2; draughtsmen, 4; bookseller, 1; art teacher, 1; messenger, 1; bricklayers, 2; bookbinder, 1; dentist, 1; woodcarvers, 2; teachers, 30; scholars, 10; Civil Service, 2; signwriter, 1; masons, 3; coppersmith, 1; brass-finisher, 1; office boy, 1; students, 12; ironmongers, 2; draper, 1; bootmaker, 1; jeweller, 1; tailors, 2; compositors, 5; engraver, 1; governess, 1; mechanics, 2; architect, 1; farmers, 3; artisans, 2; saddler, 1; whipmaker, 1.

Classes.

DRAWING AND PAINTING.—At the request of the Committee, Mr. Madden, of Christchurch, again examined these sections. His report states that the school well maintains its reputation for giving a thorough grounding in drawing and the earlier stages of art work. During the year the method of work has been generally broader, the junior students working in a variety of material, thus giving greater freedom. The life and antique work has been more combined than in former years. The sketch-club competitions have been continued as usual, and also drawing from memory of work in progress. The results of the Science and Art Department examinations are very gratifying, and must give considerable encouragement to the students. Prizes of £3 and £1 were offered by Messrs. Manning and Co., Brewers, of Christchurch, for the best bottle-labels: Miss Broome obtained the first place, and Miss Igglesden the second.

MACHINE CONSTRUCTION AND DRAWING.—This class has steadily increased in numbers and value of work. Mr. Fulton, C.E., who examined the class, after reporting upon the candidates' answers, concluded as follows: "For the time that the students have been at work, I found their work uncommonly well done. The parents of young men and the men themselves who are interested in mechanical pursuits, if they saw the work that has been done, would be quick to appreciate the great value of this class."

APPLIED MECHANICS.—After a delay of about eighteen months, caused by the difficulty of obtaining an instructor, Mr. J. A. Tripe, B.A., undertook the class, commencing with nineteen students. The great difficulty the instructor has to contend with is a want of knowledge of Euclid, algebra, and geometry upon the part of many of his class. It has always been a great difficulty to persuade students to attend as a preliminary class the geometrical drawing. Those, however, who have done so, and have attended the mechanical class, will reap the full benefits, and out-distance beyond measure those too wise to receive guidance as to their course of work. Mr. Fleming, B.A., LL.B., who examined the class, after expressing satisfaction with regard to the answers in the paper set, remarks that "the class is doing work of a kind which requires every encouragement. My hope is that the work may be extended, and that the students may have an opportunity of studying elementary mathematics in all its branches." There can be no doubt that this class has met a decided want in connection with the mechanical trades.

ARCHITECTURAL DRAWING AND BUILDING CONSTRUCTION.—There is considerable improvement in the attendance during the year, but considering the large number engaged in the trade the class

is comparatively small. Excellent results were obtained in the examination conducted by Mr. F. de J. Clere, F.R.I.B.A., who speaks highly of the work done.

PLUMBING CLASSES.—These classes have been conducted as formerly. The numbers in attendance have been very satisfactory. Mr. Mack resigned his charge of the practical class at the end of the second term, Mr. Scott being appointed to the vacancy. The members of the class presented Mr. Mack upon his retirement with an illuminated address and a gold pendant cross suitably inscribed. Large numbers have availed themselves of the opportunities of examination under the City and Guilds of London Institute, with satisfactory results, and I am glad to find a considerable number working for the advanced and honour stages of the work, thus insuring an efficiency of workmanship hitherto unknown in the colony. A board of control has been established in connection with these classes, as follows: Messrs. J. R. Blair (Chairman), A. D. Riley, and J. Campbell, as representatives of the Board of Education; Messrs. W. Mack and A. Ramsay, representing the Master Plumbers' Association; and Messrs. F. Dryden and C. W. Martin, representing the Journeyman Plumbers' Association. Regulations have now been defined with regard to the nature of the examinations, ages, and qualifications of apprentices and candidates for examination, and other matters of importance to the trade and classes. The City Council have, as heretofore, contributed to the cost of maintenance, to the extent of £60 13s. 5d. for the year's work.

CARPENTRY, WOOD-CARVING, AND MODELLING.—These classes have continued in operation throughout the year with highly satisfactory results. In the wood-carving section many very useful and handsome pieces of furniture have been carved, and I think they will prove a revelation to the public when collected for exhibition. Carving in marble has also been commenced by one of the lady students, and much good work has been done by students who are interested in their work from a trade point of view. The carpentry class has also proved successful, and I earnestly hope will, now that the usual first rush is over, steadily increase in numbers. The provisions for instruction in drawing as applied to carpentry and manual instruction are now complete.

PRACTICAL PLANE GEOMETRY AND PERSPECTIVE CLASSES have been conducted as in previous years, and have been well attended; but I am anxious to see the junior students make greater use of the facilities offered in this direction for obtaining a thorough grounding in the principles of their work. It is all very well to shirk this as drudgery in the first year's course, but the want of this knowledge, especially in mechanical pursuits, will plague them as long as they live. I would urge all students joining the school to master these essential principles first, and so save themselves a considerable amount of time in after-work.

WELLINGTON COLLEGE AND GIRLS' HIGH SCHOOL.—The numbers in attendance at the College have been respectively twenty-nine, thirty-five, and thirty-two in the three terms, the work being confined to practical plane geometry and elementary design. The classes in manual instruction in woodwork have also been conducted by Mr. Barrett, as Instructor of the Technical School. The numbers under instruction were thirty-eight for the first term, and forty-one for the second and third terms.

The Girls' High School class numbered sixteen, eighteen, and nineteen respectively for the three terms; the subjects of instruction being freehand, model, and light-and-shade drawing, still-life, and elementary design. Steady progress has been made throughout the classes; but it would be advisable to divide the College classes, in order that the instruction may be more efficient.

Examinations.

I take this opportunity of stating that examinations in our case are not like ordinary examinations, inasmuch as it is impossible to cram for the event. Further, in all cases it is a question of showing actual knowledge and power of doing work with instruments, pencil, or brush, within a reasonable time, and in a businesslike manner. Our certificates are now being recognised by various trades, and consequently are of commercial value. Further, our students have the privilege of obtaining certificates from the Science and Art Department and the City and Guilds of London Institute, either of which are valuable as being recognised and accepted by any body or society throughout the world.

The usual examinations were held during the year. As showing the increase in the work of the school, I may state that the number of papers examined during the year was 7,982, and 408 of these were scholarship papers. The increase upon last year's papers is 1,292. The number of sectional certificates issued was 4,535, and full ones 269. The number of certificates issued in all grades since the school was established in 1886 is 24,262, subdivided as follows: Primary or first grade, 19,282; intermediate or second grade, 2,782; higher or third grade, 905; South Kensington, 1,238; and City and Guilds of London, 55.

SECOND GRADE (LOCAL).—Total number of papers taken, 572, subdivided as follows: Freehand, 214 candidates—163 passed, 51 failed; geometry, 88 candidates—48 passed, 40 failed; perspective, 64 candidates—37 passed, 27 failed; model, 160 candidates—117 passed, 43 failed; memory, black-board, 46 candidates—21 passed, 25 failed: total, 572 candidates—386 passed, 186 failed: 17 "excellent," 45 "good." Number of individual candidates examined, 350; and successful, 252.

The freehand and model papers were undoubtedly "good." The perspective papers were "very fair." Practical geometry was unsatisfactory, the paper set requiring a knowledge of the principles of the work. Those candidates who merely worked through the text-book without applying the principles would find the paper difficult. In the majority of failures the two problems in solid geometry were not attempted, particularly so in the case of candidates outside Wellington. As solid geometry is of the utmost importance from an industrial and constructive point of view, one of the two problems should be answered, and in future this will be required.

THIRD GRADE (LOCAL).—The results were satisfactory, especially in outline from the cast, and models, light and shade, and colouring. In the second examination in plumbing there was a distinct advance in the theory. Number of papers taken, 280: passes, 165; failures, 115. Individual candidates, 136; individual passes, 100. Papers "excellent," 19; papers "good," 37.

Science and Art Department, South Kensington.

The results in connection with the examinations of the above department are of a very satisfactory nature. Wellington is the only school in the Australasian Colonies awarded a prize in the national competition; 47,978 works were submitted from 269 schools throughout the United Kingdom and the colonies, and of these only 4,044 were selected for national competition. A national third-grade prize for design was awarded to Florence Broome. Four students obtained sufficient marks in the competition to entitle them, under the department's regulations, to free studentships for one year.

Wellington having no art collection, either industrial or artistic, our students labour under exceptional disadvantages as compared with other towns, and especially the English schools, where loans of the most artistic and valuable objects are constantly obtained. I therefore hope to obtain through the Education Department a loan of prize works in connection with the next national competition, and would suggest their exhibition at the Industrial Exhibition, and thence to the three other centres; such works would be invaluable to the students, and give some idea of the nature and value of the competition.

Students are again reminded of the requirements of the elementary drawing certificate. The subjects are as follows: (a) Freehand drawing (subject 2B), a first-class pass; (b) model drawing (subject 3A), a first-class pass; (c) shading from casts (subject 5B), a first-class pass; (d) a pass in the elementary stage of science, subject I. (geometry).*

SECOND-GRADE ART.—Number of papers taken, 202: passed, 137; failed, 65.

			First Class.	Second Class.	
Freehand	...	83 candidates	22	22	39 failed.
Model	...	75	18	37	20
Perspective	...	11	5	5	1
Light and shade	...	33	20	8	5

Outside districts: Papers taken, 17: passed, 7; failed, 10.

THIRD-GRADE ART.—Number of papers submitted, 46: passed, 41; failed, 5. The passes are as follows: Outline from the cast: 10 papers taken; 9 passed; 1 excellent. Shading from models: 11 papers taken; 10 passed. Light and shade from the cast: 13 papers taken; all passed; 1 excellent. Drawing from the life: 2 papers taken; 2 passed. Drawing from the antique: 3 papers taken; 2 passed. Still-life: 3 papers taken; 1 passed. Monochrome: 1 paper taken; 1 passed. Design: 2 papers taken; 2 passed. Perspective: 1 paper taken; 1 passed.

SCIENCE.—Numbers of papers submitted, 41: passed, 24; fair, 8; failed, 9.

The results of the year's examinations in connection with the Science and Art Department would have entitled the Board, had the school been within Great Britain, to a grant of £228 in aid of the higher work, and £220 upon the results of the primary-schools drawing examination. It is satisfactory to report that advantage is now being taken of the examinations in science subjects, especially by the teachers in the Board's service. The science subjects in which candidates may be examined are again stated for information, and are as follows:—

Practical, plane, and solid geometry; machine construction and drawing; building construction; naval architecture; mathematics; theoretical mathematics—(a) solids, (b) fluids; applied mechanics; sound, light, and heat (elementary stages)—(a) sound (advanced stage and honours), (b) light (advanced stage and honours), (c) heat (advanced stage and honours); magnetism and electricity; inorganic chemistry (theoretical); inorganic chemistry (practical); organic chemistry (theoretical); organic chemistry (practical); geology; mineralogy; human physiology; general biology; zoology; botany; principles of mining; metallurgy (theoretical); metallurgy (practical); navigation; nautical astronomy; steam; physiography; principles of agriculture; hygiene.

City and Guilds of London Institute for the Advancement of Technical Education.

The examinations under this department have been conducted as usual. The number of candidates examined in theory and practice was 49; 32 passed and 17 failed. In the theory of plumbing 15 of 25 candidates were successful, and in practice 12 of 16 were successful. The examiners in their general report state that in practice in some centres only a small portion of the work was completed, but in others the whole of the candidates completed their task in a creditable manner, and well within the time allowed.

Candidates may now present themselves for any of the under-mentioned sections. The examinations are in two grades—(1) Ordinary; (2) honours. The ordinary examination is intended principally for apprentices and journeymen; the honours examination for foremen, masters, managers, and teachers. Candidates may enter themselves in either grade, except in certain subjects, in which they are required to obtain the ordinary grade first. Candidates may obtain a first- or second-class in either grade. If a second-class is obtained, they may sit again for the higher classification. In plumbers' work no certificate will be given to candidates who pass in the practice but fail in the theory. The examinations are held in May. Application for permission to sit is required to be made on or before 20th December. A registration-fee of 2s. 6d. per section is charged for this examination; candidates for practical work paying the cost of material also.

The subjects of examination are as follows: Salt manufacture, alkali manufacture, soap manufacture, bread-making, brewing, spirit manufacture, coal-tar products, sugar manufacture, painters' colours, oils, and varnishes; oils and fats, including candle manufacture; gas manufacture, iron and steel manufacture, paper manufacture, photography, pottery and porcelain, glass-making, dressing of skins, leather tanning, boot and shoe manufacture, silk dyeing, wool dyeing, cotton dyeing, cotton and linen bleaching, calico and linen printing, wool and worsted spinning, cloth weaving, cotton spinning, flax spinning, linen weaving, silk throwing and spinning, silk weaving, jute spin-

* The elementary stage of this paper is the second paper upon the examination paper, not the first.

ning, jute weaving, lace manufacture, framework-knitting and hosiery, hat manufacture, telegraphy and telephony, electric lighting and power distribution, electro-metallurgy, metal-plate work, plumbers' work, silversmiths' work and plated wares, goldsmiths' work and plated wares, watch-making and clock-making, mechanical engineering, road carriage building, rail carriage building, typography, lithography, raising and preparation of ores, mine surveying, milling (flour manufacture), carpentry and joinery, ship's carpentry, ship's joinery, brickwork and masonry, plasterers' work, dressmaking, woodwork (for teachers of elementary schools), cotton-weaving.

I hope that advantage may be taken of these examinations by the various trades, and especially by the apprentices.

Prize List.

The following prizes were awarded in the various classes for the year's work ending December :—

1. Day classes, for the best progress : Awarded by His Excellency the Governor. 2. Evening drawing-class, for the best progress : Awarded by Lady Glasgow. 3. Life class, for the best examination study : Awarded by Mrs. Levin. 4. Students in connection with the building trade, for the best general progress (advanced section) : Awarded by Builders' Association. 5. Students in connection with the building trade, for the best progress (elementary section) : Awarded by Builders' Association. 6. Mechanical students, for the best mechanical drawing : Awarded by the Ironfounders. 7. Mechanical students, for the best progress in second year's work : Awarded by the Ironfounders. 8. Mechanical students, for the best progress in first year's work : Awarded by the Ironfounders. 9. For the best set of subject sketches : Awarded by Messrs. McGregor Wright and Co. 10. For the best set of still-life studies : Awarded by A. de B. Brandon, Esq. 11. The best set of designs : Awarded by E. Pearce, Esq. 12. The best set of memory drawings : Awarded by Mrs. Sharp. 13. Second-best set of memory drawings : Awarded by F. Brady, Esq. 14. Teachers' classes, for the best progress : Awarded by Messrs. Whitecombe and Tombs. 15. Primary-scholarship holders, for the best progress : Awarded by H. D. Bell, Esq., M.H.R. 16. Wood-carving, evening classes, best progress : Awarded by J. P. Firth, Esq. 17. Applied mechanics, the best paper : Awarded by the Ironfounders. 17. Boys' manual instruction classes, best progress : Awarded by G. E. Tolhurst, Esq.

Library.

The library now consists of 380 volumes upon technical, science, and art subjects. Over 200 volumes have been circulated amongst the students in connection with their special requirements and trades. The additions to the library during the year have been as follows : Mechanical section.—Strength of Materials (Anderson), Railway Appliances (Barry), Steam (Ripper), The Electrician (1894), Workshop Appliances (Shelley), Elements of Machine Design (Unwin), Engineering (2 vols., 1894), Machine Drawing and Design (Low), Magnetism and Electricity (Baker), The Engineer (2 vols., 1894). Architectural section.—The Architect and Contract Reporter, Kensington Handbook of Architecture, The Builder (2 vols., 1894), Woodwork (Manual of Instruction), The Architect (1 vol., 1894), Carpentry and Joinery (Wilson), Working Diagrams for Models, Woodwork Course for Boys, Lessons in Woodwork. General and art section.—Decorative Art (1894), Work (1894), Art Journal (1894), Decorative Design (Jackson), Design (Hutton), Drawing Instruments (Stanley), Elementary Art Teaching (Taylor), Manual Training Exercises, Hand and Eye Training (Ricks), Theory and Practice of Design (Jackson), Standard Algebra (Collins), Harpur's Euclid (Langley and Phillips), Teachers' Handbook of Slöyd, Theory of Slöyd, Elementary Design (Hatton), Alphabets (Ames), Hand and Eye Training (Goetze).

The following contributions have been received : From Mr. Evans—working drawings for carriage-building ; objects of art and plant form have been kindly lent by His Excellency the Governor, Mrs. T. C. Williams, Mr. David Anderson, and the Dresden Company.

PERIODICALS.—The following contributions have been received : The Engineer, from the publishers ; Work, from Messrs. Cassell and Company ; The Decorator, from Messrs. Baillie Brothers ; The Electrician, from Lady Glasgow ; Engineering, from the Education Board ; The Idler, from J. A. Tripe, Esq. ; The Art Journal, from J. Pearson, Esq. ; The Magazine of Art, from Dr. Grace ; The Sketch, from Mrs. E. Samuel ; The Studio, from J. M. Nairn, Esq. The above are placed for the use of the students, and at the end of the year are bound and added to the library.

Distribution and Exhibition.

The prizes were distributed in the large hall on the 10th April, by J. R. Blair, Esq., Chairman of the Board, in the presence of a large assembly. The works of the students were exhibited in the hall for three days previous to their departure for South Kensington. The exhibition was well patronised by the public, who seemed to take considerable interest in the display.

General Remarks.

VISIT TO THE S.S. "GOTHIC."—About thirty students visited this magnificent vessel for the purpose of examining the wood-carving and decorations, Mr. Barrett, the instructor in carving, explaining the styles and methods of treatment. Captain Kidley very kindly provided afternoon tea for his visitors, and did everything possible to make the visit pleasurable as well as instructive. The mechanical students will visit the vessel upon her return for the purpose of inspecting her machinery and engines.

During the year the school has been visited by several persons from other centres, specially appointed to obtain information as to the system adopted, and a considerable correspondence has also been conducted with various committees and associations requiring information.

There can be no doubt that the success of the work is mainly owing to the thorough grounding given in the primary and elementary work, the value of which is now being felt throughout the entire district. The whole work, from primary to secondary and thence to the higher and individual trade branches, being controlled by one centre gives undoubted advantages, which other centres lack.

With reference to the technical classes, it is disappointing to find the employers, with the exception of the Ironfounders' and the Builders' Association, who contribute to the prize fund on behalf of their respective trades, do not sufficiently interest themselves in the matter of this education, for undoubtedly they reap the greater advantage. The success of the movement would, I believe, be almost doubled if the employers would show that they valued it, and would take a practical interest in the work of the school in connection with their employes. I hope sincerely that ere long they (the employers) will awake to the enormous importance to themselves, their workmen, and the colony, of the advantages of technical work, for it is undoubtedly a strong step towards commercial prosperity.

FINANCE.—The cost of the school to the Board has, by the most rigid economy, been considerably reduced, and is now practically a profit to the Board to the extent of £165. The total expenditure for the year is £1,761 16s., receipts £1,163 15s., leaving a balance of £598 1s.; as against which there is £115 6s. 6d. due from the City Council and the Education Department, but this sum had not been paid to our credit before the 31st of December; deducting this amount, the balance is £482 14s. 6d. actual cost to the Board.

The following items are chargeable against this sum :—

	£	s.	d.
Instruction to 104 teachers at 15s. per quarter	312	0	0
„ 60 scholarship-holders at 10s. per quarter	120	0	0
„ 21 teachers at evening classes at 7s. 6d. per quarter	31	10	0
Cost of primary examinations... ..	110	0	0
Inspection of schools and correspondence class work	75	0	0

Leaving a credit balance of £165 16s.

£648 10 0

The year has been an exceptionally hard one, owing to the large increase of duties in all departments. As will be seen by the summaries, there were 7,982 works examined during the year, an increase of 1,292 upon the previous year, and in one quarter there were 579 students at work in over twenty-three distinct sections. The work of the school has fully doubled itself in the past five years.

My thanks are due to all those whom I have named, and who have so generously contributed to the successful year's working, either by loans or contributions of prizes, books, periodicals, or appliances; to Messrs. J. Fulton, C.E., F. de J. Clere, J. M. Madden, T. Fleming, B.A., LL.B., who acted as honorary examiners; to the supervisors; and to my staff, of whom, for their energy and very sincere interest in the welfare of the school, I cannot speak too highly; and to the Board's committee for the careful consideration given to matters affecting the school's welfare.

I have, &c.,

The Chairman, Wellington Education Board.

ARTHUR D. RILEY, Director.

4. SCHOOL OF ART AND DESIGN, DUNEDIN.—REPORT OF THE PRINCIPAL.

SIR,—

I have the honour to submit my annual report on the School of Art and Design for the year 1895.

At the beginning of the session important additions were made to the teaching staff—Signor Nerli was appointed visiting master for art; F. M. Payne, for machine construction and drawing; and D. Sheriff for building construction. This assignment of duties has worked well, and the organization is becoming more complete.

With the exception of a slight change which was made about the middle of the session, the arrangement of the different classes is the same as previously reported. Owing to the crowded state of the painting and life class-rooms, it was found necessary to make two divisions of each class. This change enabled the students to study under more favourable conditions as to light and room, and the teacher had more time to devote to personal instruction.

The total number of students who received instruction during the past year was 360, showing an increase of thirty-seven since last year. This total includes 111 students and pupil-teachers, eighteen students in training, ninety-seven students who attended the day classes, 134 students who attended the evening classes. Though the total number of students attending the evening classes has increased, the number in the mechanical classes is still comparatively small, there being only thirty-one students therein out of the total of 134 enrolled. It is to be hoped that the liberality of the Board in establishing art classes bearing directly on industrial pursuits, and therefore specially helpful to artisans, will speedily meet with its reward in a large accession to the number of students in attendance at these classes. The success of our students at the recent science and art examinations, details of which are given below, and the work of the machine and building construction classes shown at our last exhibition, will, I feel confident, cause an influx of students to these classes.

London Science and Art Department Examinations.

The South Kensington Science and Art Department's examinations took place on the 6th, 8th, 9th, and 10th July, with the following results:—

Subject.	Stage.	Number examined.	Passed.		Failed.
Elementary stages—					
Freehand drawing	2B	102	47 first class	28 second class	27
Model drawing	3A	63	20 "	21 "	22
Drawing in light and shade	5B	20	16 "	2 "	2
Geometrical drawing	I.	15	13 "	...	2
Perspective	1c	7	4 "	2 "	1
Totals	...	207	100 first class	53 second class	54
Elementary drawing certificates completed (full certificates)	...	9	5 first class	4 second class	...
Advanced stages—					
Freehand drawing	3B	5 {	1 excellent 3 first class		1 ...
Model drawing	5A	5 {	3 " 1 excellent	2 second class 2 "	
Drawing in light and shade	5B	5 {	2 first class	... 1 "	
Principles of ornament	22	1	...	1 "	...
Geometrical drawing	1E	1	...	1 "	...
Machine construction	II.	4	2 first class	1 " ...	1 1
Building construction	III.	4 {	1 excellent (stage A) 2 first class		1 ...
Theoretical mechanics	VI.	1	1 "	...	...
Applied mechanics	VII.	1	1 "	...	...
Totals	...	27	17 first class	7 second class	3

Four students have passed all the personal examinations for the art teacher's certificate.

Local Examinations.

At the December examinations the total number of students and pupil-teachers examined in the second grade was as follows:—

Subjects.	Number examined.	Passed.			Failed.
		Excellent.	Good.	Fair.	
Freehand drawing	26	11	7	8	...
Model drawing	32	13	12	4	3
Geometrical drawing	26	6	8	7	5
Perspective	13	...	7	6	...
Drawing on blackboard	17	7	6	4	...
Drawing in light and shade	9	1	3	5	...
Totals	123	38	43	34	8

Students from the School of Mines:—

Subjects.	Number examined.	Passed.		Failed.
Model drawing	8	6 first class	2 second class	...
Practical geometry	8	5 "	2 "	1
Solid geometry	5	2 "	3 "	...
Machine drawing	7	7 "	...	...
Totals	28	20 first class	7 second class	1

The prizes offered by the Council of the Otago Art Society, Artists' Colourmen, the Builders' Association, N. Y. A. Wales, Esq., James Hislop, Esq., and "a friend," were awarded as follows: Otago Art Society—Silver medal for the best life-study done during the session: John Kilgour. Artists' Colourmen—Box of oil- or water-colours for the best design for a decorative panel: Miss M. Blundell. Artists' Colourmen—Second prize, box of oil- or water-colours for the best landscape, in either oil- or water-colours, painted direct from nature. (This prize was not awarded. Owing to the inclemency of the weather the competitors could not finish their studies in time; the judges, however, agreed to leave the competition open for next session.) N. Y. A. Wales—Prize for the best drawing in light and shade, from the cast: Miss E. Napier Bell. J. Hislop—Prize for the best outline drawing from the cast: Miss C. Klee. (Mr. Hislop was so well pleased with the outline drawings that he awarded Miss E. Bridger a prize for her outline drawing of foliage from nature.) "A friend"—Silver medal for the best drawing of the figure from the antique: Theodore Cameron. The Builders' Association scholarship is to be awarded when the school reopens.

These prizes caused a good deal of emulation, and had a beneficial effect on the competitors, who highly appreciated the generosity of the donors.

The first presentation of science and art certificates took place in the school on the 27th March. The Hon. J. MacGregor addressed the students and presented the certificates. W. M. Hodgkins, Esq., President of the Otago Art Society, and James Hislop, Esq., also addressed those present.

About forty original drawings and paintings have been framed and glazed and are on exhibition in the school. These drawings are of inestimable value as works of reference to the students preparing work for competition or certificate drawings. Several important additions have been made to the collection of casts and vases to assist in teaching and to meet the requirements of the Science and Art Department.

The general progress of the school has been satisfactory, and the work done in the various classes evinces a great advance on former years. This may, perhaps, be more noticeable in the advanced studies from life and the machine-drawing.

I cannot speak too highly of the zeal and assiduity with which all the members of the staff have devoted themselves to their respective classes.

The annual exhibition of the students' works was open three days, and attracted a large number of visitors.

I have, &c.,

DAVID C. HUTTON, Art Master, Principal.

The Secretary, Otago Education Board.

The following list shows the occupations of the students who attended the evening classes: Artist, 1; bank clerk, 1; blacksmiths, 2; boilermaker, 1; book-canvaser, 1; bricklayers, 2; cabinetmaker, 1; carpenters, 11; clerks, 7; coachbuilders, 2; compositors, 3; confectioner, 1; decorator, 1; drapers, 3; dressmakers, 2; electrical engineers, 2; engineers, 9; fitter, 1; ironmongers, 2; jeweller, 1; land agent, 1; lithographers, 6; milliner, 1; moulders, 2; photographic artist, 1; painters, 8; patternmakers, 3; plasterer, 1; plumbers, 2; retouchers, 3; saddler, 1; sailmaker, 1; salesman, 1; shop-assistants, 2; surveyor, 1; signwriters, 2; students, 27; teachers, 2; tinsmith, 1; traveller, 1; typist, 1; upholsterer, 1; no occupation or home duties, 11: total, 134.

5. MINUTE OF THE COMMITTEE OF COUNCIL ON EDUCATION, 5TH AUGUST, 1890

SUGGESTIONS as to formulating the course of manual instruction to be given under the minute of 5th June, 1890:—

The Lords of the Committee of Council on Education desire to leave the managers of schools as free as possible in formulating the course of manual instruction to be given under the minute of the 5th June, 1890, for grants from the Department of Science and Art, provided that this course be adapted to teach the use of tools employed in handicrafts, not so much as an initiation in a special handicraft as a disciplinary educational course to train the hand and eye to accuracy by a progressive series of exercises connected with freehand drawing and drawing to scale. As, however, many questions have been asked as to what precise form of instruction should be followed, the following observations have been prepared. These must, however, be considered more in the light of suggestions than regulations.

Before commencing to work with tools it will be found very useful to practice the children in cutting out and putting together solid models in cardboard or paper from plane projections (known technically as "nets").

All work with tools must, as stated in the minute, be from careful full-size drawings prepared by the scholar, the dimensions being taken off this drawing in the workshop.

The tools required for the early stages of manual instruction in carpentry are the saw, the plane, and the chisel. The construction and mode of use of these tools, the proper methods of sharpening them and of keeping them in good working order, should form the subjects for preliminary lessons. A great variety of exercises may be arranged, suited to the strength and ability of the scholar, in the use of these tools, which will give an elementary knowledge of the principles of construction, and at the same time teach accuracy and carefulness.

Clear ideas respecting the various kinds of hard and soft woods, the growth and structure of wood, its fibre and grain, may be given by means of a small collection of the different descriptions of timber commonly used in carpentry, with longitudinal and cross sections.

The earlier exercises should include some such as the following :—

Sawing off across the grain of the wood, and sawing along the grain of the wood, blocks and strips of given dimensions taken from a drawing prepared by the boy himself from a model, and having marked on it the required dimensions. Many varieties of tenon and of halved joints can be made in the rough by the saw alone.

The use of the plane can be commenced by planing small surfaces about 9in. in width and then planing down strips to a given thickness. The planing of two surfaces at right angles to each other, the preparation of a right square prism and of a hexagonal prism, and the construction of a straight-edge with bevelled edges can follow.

The joints used by carpenters form a valuable series of exercises in which the use of the chisel may be learnt; such as the various forms of halving, of mortise and tenon, notching, dowelling, dovetailing, groove-and-tongueing, and scarfing with keys or wedges. The teacher should draw up a complete series of simple and graduated exercises for the early stages which all members of the class should execute in turn. No attempts should be made at first to construct small articles of furniture.

The proper use of nails and screws should be explained and practised till a fair measure of accuracy has been attained.

So far the instruction does not involve the use of curved surfaces. If the workshop is provided with a lathe, another graduated series of exercises might be arranged to include the simpler forms of turning, but this is not insisted on.

In iron the student should begin by chipping a plane surface, then completing it with a file; filing a cube till the sides are accurately plane and parallel to each other; making a hexagonal prism and a hexagonal bolt-head will be found good exercises for using the file. Drilling a circular hole in an iron plate, screw-cutting, and similar exercises will enable a lad to take part in the construction of some useful tool for the workshop. Instruction may subsequently be given in the methods of joining metal-work by welding, riveting, &c. The use of cold riveting may be shown even where there is no smith's hearth. A similar series of exercises might be introduced for brass in place of iron. Where facilities exist a lathe for metal-work and a blacksmith's forge will be found extremely useful.

There should be not less than 4ft. run of bench for each boy under instruction, and he should have a space of at least 2ft. in width in front of the bench. The room should be well lighted and ventilated. There should be a bench and set of tools for the use of each scholar when under instruction, with a proper place in which to keep them, each bench being provided with a wood or metal vice as the case may be. A teacher cannot properly direct the manual instruction of more than about twenty boys at one time.

6. PROGRAMME OF THE CITY AND GUILDS OF LONDON INSTITUTE EXAMINATIONS FOR TEACHERS OF MANUAL TRAINING IN PUBLIC ELEMENTARY SCHOOLS.

MANUAL TRAINING—WOODWORK.

With the view of certifying to the efficiency of qualified teachers under the Education Department of Public Elementary Schools to give instruction in woodwork in accordance with the provisions of the Code (1890), the City and Guilds of London Institute is prepared to issue certificates to such teachers on the following conditions :—

1. The candidates will be required to give evidence of having regularly attended, during the session preceding each examination, a course of at least twenty practical wood-working lessons given on separate days in a school or class registered by, and under an instructor approved by, the Institute.

Each lesson should be of at least two hours' duration; and no two lessons may be given on the same day.

In order that a class may be registered, it must be under the direction of a committee of a School Board, or municipal council, or technical school, or other public body.

2. The candidates will further be required to pass two examinations, one at the end of each year's course, to be conducted by examiners appointed by the Institute, and to pay a fee of five shillings for each examination.

First Year's Examination.

The examination to be held at the end of the first year's course will consist of (1) drawing, (2) practical exercises in wood-working.

Provision for holding the examinations and arrangements for supervision must be made by the committee of each school. Either tools must be provided for the practical examinations, or the candidates must be required to bring them.

1. *Wood-working.*—Candidates will be provided with suitable sawn pieces of wood, and will be required to reduce them by the plane, saw, or chisel to any simple forms shown by dimensioned sketches. They will also be required to construct from such pieces of wood any of the simpler joints, or any very simple combination of such joints, to dimensioned sketches.

2. *Drawing.*—Candidates should have clear notions regarding the accurate representation of solids on a flat sheet of paper. The nature of the following kinds of projection should be understood :—

(a.) Orthographic projection (plan, elevation, section) in which the projectors are at right angles to the plane of projection.

(b.) Oblique projection, in which the projectors are parallel to each other, but oblique to the plane of projection.

Candidates will be required to show ability to draw accurately to scale, in plan and elevation, simple solids, and some of the simpler joints, such as housing, angle bridle, open mortise and tenon, dovetail halving, lap halving, &c.; also very simple frames or combinations of joints. The joints may be drawn in their simplest positions, compatible with the clear representation of their form and dimensions.

Candidates must also show ability to represent simple joints in oblique projection, the plane of projection being parallel to one set of the principal faces of the object, so that the projection shows the true shape of these faces. Oblique projections, being intended to be pictorial views, may be simply neat freehand sketches.

To pass the examination, candidates must satisfy the examiners in each of the subjects 1 and 2. The number of marks will be apportioned as follows: Wood-working, 250 marks; drawing, 100 marks.

Final Examination.

Candidates for the final examination must have previously passed the first year's examination.

The final examination will consist of more advanced exercises in wood-working and drawing, and also of questions on the technology of woodwork and methods of instruction.

1. *Wood-working*.—Exercises similar to those for the first year, but more difficult. Dimensioned sketches will be given as a guide of what is required.

The accuracy of fitting, accuracy of dimensions, and the time taken will be considered in valuing the work done.

2. *Drawing*.—Making freehand sketches of, and drawing to scale from, dimensioned sketches, ordinary joints used in woodwork, or any simple frames or simple framed objects made of wood.

Hand sketches of simple joints and frames as seen in oblique projection.

3. *The Written Examination* will include questions founded on such subjects as the following: 1. Woods: Places from which some of the commoner woods are obtained. Their characteristic properties and uses. The general structure of cone-bearing and leafy timber trees. The meaning of seasoning timber. Effects of shrinkage and warping. Identification of specimens of wood. The questions will be limited to oak, ash, elm, beech, mahogany, sycamore, basswood, white deal (spruce), red pine (Scotch fir), yellow pine. 2. Tools, &c.: Description of the construction and mode of using ordinary wood-working tools. Methods of using nails, screws, and glue. 3. School management: Fittings and cost of equipment of school workshop. Arrangement of pupils. Character of institution and sequence of lessons. The special characteristics of Sloyd and of other systems of teaching.

To obtain a certificate candidates must pass in each of the three subjects, 1, 2, and 3. The number of marks will be apportioned as follows: 1. Wood-working, 400 marks; 2. Drawing, 100 marks; 3. Written examination, 100 marks.

Works of Reference.—Barter's "Manual Instruction—Woodwork" (Whittaker and Co.); Goss's "Bench Work in Wood" (Trubner); Wood's "Manual Instruction in Woodwork" (Simpkin, Marshall, and Co.); Ward's "Timber Trees" (Macmillan), and "The Oak" (Paul, Trench, and Co.); Low's "Solid Geometry," Part I. (Longmans).

MANUAL TRAINING—METAL-WORK.

With the view of certifying to the efficiency of teachers to give instruction in metal-work, the City and Guilds of London Institute is prepared to issue certificates to qualified teachers of public elementary schools on the following conditions:—

1. Candidates must have already passed the Institute's first year's examination in manual training—woodwork.

2. The candidates will be required to give evidence of having regularly attended, during each of two sessions, a course of at least twenty practical metal-working lessons given on separate days, each of not less than two hours' duration, in a school or class registered by, and under an instructor approved by, the Institute.

In order that a class may be registered, it must be under the direction of a committee of a School Board, or municipal council, or technical school, or other public body.

3. The candidates will further be required to pass two examinations, one at the end of each year's course, to be conducted by examiners appointed by the Institute, and to pay a fee of ten shillings for each examination.

Teachers of woodwork in public elementary schools (whether certificated teachers or not) who give evidence of having satisfactorily taught a class of pupils in woodwork for a period of not less than one year, and who produce a certificate from Her Majesty's Inspector to that effect, are eligible under the conditions given in paragraph 2 to sit for the first year's examination, and subsequently for the final examination in manual training—metal-work.

Teachers of metal-work who give evidence of having satisfactorily taught, for a period of two years, a class of pupils in metal-work at a public elementary school, and who produce a certificate from Her Majesty's Inspector to that effect, are eligible without attendance at any class to sit for the first year's examination in manual training—metal-work.

First Year's Examination.

The first year's examination will consist chiefly of practical exercises in metal-work, but candidates will also be required to answer in writing a few simple questions on the tools used and methods employed in working the exercises of the following syllabus, and on the chief properties of the common metals in their relation to workshop processes.

The exercises for the practical examination will be such as are included in the following syllabus, and candidates should be able to complete any of the exercises mentioned, but they will be required to pass in two only of the divisions A, B, and C.

Division A: Vice-work.—The form and use of flat and cross-cut chisels; flat, round, square, and half-round files; scrapers; taps, stocks, and dies; screw-plates; measuring and other tools, including calipers, square, centre-punch, scribing and V blocks, straight-edges and surface-plates. Different forms of vices for bench-work, and the grinding and keeping in order of the tools used. Chipping, filing, and scraping cast-iron, wrought-iron, steel, brass, and gun-metal to simple forms and given dimensions. Cutting keyways and holes from plates or blocks to fit a given gauge, and preparing and fitting taper- and headed-key, or other piece. Cutting out and filing up a hexagon or octagon gauge from thin plate, filing and preparing a straight-edge. Drilling, tapping, and filing to shape a square or hexagonal nut; screwing round bar with screw-plate and stocks and dies to fit a given nut.

Division B: Bench-work.—Composition of soft solders; use of copper soldering-bit; composition and use of ordinary fluxes; soldering simple joints in tin- and brass-work. The connection of plates and bars, and of joints, with rivets, single- and double-countersunk, hammered cold.

Division C: Forge-work.—The form and use of the ordinary forge tools, management of fire, precautions to be observed in heating metals, drawing out bars to square and round ends, parallel, and taper; bending iron to simple curves, or to square or circle of given size; jumping-up. Forging of simple examples, as headed-key, spike-nail, &c.; forging and tempering centre-punch, drill, and small chipping-chisel. Connection of pieces of bar by welding. Case-hardening with prussiate of potash. Annealing.

Final Examination.

Candidates for the final examination must produce a certificate of having passed the first year's examination. They will be required to undergo an examination in practical work, and also a written examination and a drawing examination.

1. *Practical Work.*—Exercises may be selected from the first year syllabus A, B, and C, only that greater accuracy and finish will be expected; or more difficult exercises of the same character, including examples in brazing, may be set.

Candidates will also be required to work exercises requiring a use of the simple lathe and drilling-machine to the following syllabus: Form and use of hand-tools for turning iron and brass; centreing of work and fixing in lathe; turning of plain cylindrical rod; simple taper and collar turning; use of V centre for drilling; turning of simple curved pieces to template. Chasing screw-threads. Use of slide-rest and back gear; and of shifting headstock for taper-turning. Methods of screw-cutting. Exercises may be set involving forge, vice- and lathe-work, and drilling.

2. *Written Examination.*—Forms and angles of cutting-edges of tools as used for vice- and bench-work, and for lathes and drilling-machines. Construction and use of simple lathes and drilling-machines, including the use of change-wheels for screw-cutting. The working of steam-engines and gas-engines, and the arrangement of shafting, pulleys, and belting, with some knowledge of speed and methods of running, so far as relate to their use for driving purposes in school workshops. The fitting and equipment of a school workshop and arrangement of lessons. Workshop methods and properties of materials, so far as relating to the exercises of the practical examination.

3. *Drawing Examination.*—Making freehand dimensioned sketches in plan and elevation of hand- and machine-tools, and other workshop fittings, and of exercises for practical work. Making working drawings to scale, in pencil, from dimensioned sketches.

Candidates must pass in each of the three subjects 1, 2, and 3, in order to obtain a certificate. The practical work will receive four times the marks of either of the other subjects.

Certificates will be granted on the result of each examination, but the teacher's certificate will be given to those candidates only who have passed the final examination.

Works of Reference.—"Principles of Fitting" (Whittaker and Co.); "Metal-turning" (Whittaker and Co.); "Workshop Appliances," by C. P. B. Shelley (Longmans).

7. REPORT OF THE SCHOOL BOARD FOR LONDON, MARCH, 1895, CHAPTER VII.

WORK OF THE JOINT COMMITTEE, CONSISTING OF REPRESENTATIVES OF THE SCHOOL BOARD FOR LONDON, THE CITY AND GUILDS OF LONDON TECHNICAL INSTITUTE, AND THE WORSHIPFUL COMPANY OF DRAPERS.

In the month of April, 1886, the Minuting and Educational Endowments Committee of the School Board for London considered that technical classes might, with great advantage to the public, be established in certain suitable Board schools without charging the cost upon the rates. The decision of the Committee was communicated to the Board.

A list of unused buildings and class-rooms, suitable in respect of accommodation and locality, which were not required at that time for ordinary school purposes, was prepared.

The Committee, being of opinion that some of the principal city guilds were in sympathy with the objects they had in view, recommended the Board to appeal to the guilds, and to express the hope that those bodies would be willing to make grants towards the cost of maintaining the proposed

technical classes in the event of the School Board for London providing suitable class-rooms. The Committee called the attention of the Board to the fact that, in the case of children drawn from ordinary instruction given in public elementary schools during school-hours in order to attend the proposed technical classes, such attendance at the technical classes would probably not count as a school attendance, inasmuch as the subjects to be taught were not defined as "specific subjects" under Article 16 of the (then) new code.

The Committee recommended the Board to address a communication to the Education Department, asking their Lordships to recognise technical instruction as a "specific subject" under the last paragraph of Article 16 of the (then) new code, which paragraph read as follows: "Any other subject than those (*i.e.*, obligatory and optional) mentioned in this article may, if sanctioned by the department, be taken as a specific subject, provided that a graduated scheme of teaching it be submitted to, and approved by, the Inspector."

The Board, acting on these recommendations, instructed the Committee to prepare and forward to each of the city guilds and to the Education Department respectively the letters on the subject of technical instruction which had been authorised by the Board in the month of April, 1886.

The Committee accordingly forwarded letters to each of the city guilds informing them that the Board had, in various parts of London, class-rooms and unused buildings in which manual instruction might be given, submitting that the classes might be made available (*a*) for children in attendance in Board schools, and (*b*) in the evening for young persons who were free from the obligation of attending an elementary school; submitting, further, that the Board had no funds by means of which they could provide fittings for such classes, or supply them with teachers, apparatus, or tools, and that, even if the Education Department should ultimately consent to award a grant in aid of the classes attended by children from Board schools, such grant would be applicable only to current expenditure. The letters, however, expressed on behalf of the Board the hope that each company might be ready to co-operate with the Board in promoting the establishment of such classes by making a grant towards their establishment and maintenance, the Board being prepared to submit a list of rooms which might be made available in various parts of the metropolis, and also a list of subjects in which it was proposed to give technical instruction; but adding that the Board would be glad to receive any suggestion from the guilds.

A letter was also forwarded to the Education Department on behalf of the Board, enclosing a copy of the communication which had been sent to each of the city guilds, asking, with reference to the last paragraph of Article 16 of the (then) new code, whether the subjects taught in such classes would be sanctioned by the department as "specific subjects" with the understanding that a graduated scheme of teaching would be submitted to, and the approval of Her Majesty's Inspector asked for. The letter further stated that the Board proposed that, as in the case of the cookery classes, children from various schools should be collected together at centres for manual instruction; and it was desired by the Board to ask whether attendance at such classes might be reckoned as attendance at the schools, on registers of which the children were marked, as in the case of the cookery classes.

The Education Department replied that, in accordance with the statement made by the Vice-President of the Council in Parliament, their Lordships must reserve their decision on the question thus raised until the question of technical education should have been fully considered by Parliament.

At the close of the session of 1889 the Technical Instruction Bill received the Royal assent, which Bill authorised local authorities—*i.e.*, either County or Borough Councils or urban sanitary authorities—out of the local rate, to supply, or to aid the supply of, technical and manual instruction. The Act further prescribed that this contribution should not be made on account of scholars receiving instruction in elementary schools in the obligatory or standard subjects prescribed by the minutes of the Education Department for the time being in force. [Section I. (1) (*a*) of the Act.]

In the (then) new code provision was made for manual instruction being included in the curriculum.

A letter was also addressed by Mr. Diggle, the then chairman of the Board, to the chairman of the Council of the City and Guilds of London Institute for the advancement of technical education. The result of this correspondence was a reference of the subject from the larger and more prominent city guilds to the City and Guilds Institute, with one of the sub-committees of which a deputation of members of the School Board were invited to confer, with the view of ascertaining more fully the exact nature of the proposals of the Board.

In the month of July, 1886, a deputation, appointed by the educational endowments committee, waited upon the sub-committee of the executive committee of the City and Guilds Institute, and were very courteously received.

In May, 1887, a letter was received from the City and Guilds Institute asking the Board to appoint a deputation to consult with a number of their members for the purpose of considering a scheme for the equipment and maintenance, for one year, of four schools for elementary technical education, at a cost of about £1,000.

A special committee was accordingly appointed by the Board, which committee met the representatives of the City and Guilds Institute. After a consultation, the appointment of a joint committee was agreed upon, consisting of eighteen members, of whom nine were to be appointed by the School Board and nine by the City and Guilds Institute. Owing to an extension of the work originally intended, and to the funds having been augmented by contributions from the Worshipful Company of Drapers (a more detailed reference to which is made in another part of this report), the Joint Committee was increased so as to consist of twenty-four members, including twelve appointed by the School Board, nine by the City and Guilds Institute, and three by the Drapers' Company. In April, 1892, three members were, by consent of the bodies interested, appointed by co-optation. The Joint Committee, therefore, now (1895) consists of twenty-seven members.

WOODWORK.

(a.) *Day-classes for Boys.*—The Joint Committee—subject to their obtaining from the school-management committee of the School Board permission to use, for a period not less than one year, such class-rooms or premises as might be asked for by the Joint Committee, and might be suitable for their work—determined (in the first instance) to establish six centres at which classes should be conducted—three on the north side, and three on the south side, of the Thames.

The expense of establishing, equipping, and maintaining the classes during the first year was undertaken out of the original sum of £1,000 given by the Drapers' Company through the City and Guilds Institute. The Joint Committee did not expend the whole of the sum granted by the city guilds, but had, at the end of the first year, an unexpended balance of about £116. The satisfactory working of the scheme encouraged the Board, on the recommendation of the Joint Committee, to appeal to the city guilds and to the Drapers' Company to render further pecuniary aid for continuing the experiment for another year; and the appeals were generously responded to by the Drapers' Company and the City and Guilds Institute. The Joint Committee ultimately selected six centres, at each of which a class was to be held. The headmasters of the surrounding public elementary schools—both Board and non-Board—were invited to hold a conference with the Joint Committee as to the best methods of securing the attendance of boys from such schools, and also as to the number of scholars in proportion to the several school-rolls. The headmasters very cordially entered into the project, and have since manifested considerable interest in the progress of the work.

As to the details of the method of instruction, the Committee deemed it advisable, for a time, to abstain from giving specific directions to the instructors who should be appointed, and to leave the instructors to frame their own methods, subject to the broad lines laid down under a syllabus suitable for the first year's work. So successful was the experiment that at the end of the year it was thought desirable to enlarge the scope of the Committee's work by providing an extended syllabus, which included the original one worked by the boys in the first year, together with an advanced course for those who should continue their attendance during a second year. The following is the enlarged

SYLLABUS.

I. Principles.

1. The aim must be educational rather than industrial.
2. The scholars must be given an intelligent knowledge of the principles which underlie their work.
3. Working drawings to scale, of every exercise, should be made.
4. All bench-work should be done to exact measurement, and every piece of wood correctly lined before being cut or planed.

*II. Practice.**A. Object-lessons.*

1. Woods commonly used⁽¹⁾—(a) their structure and conditions of growth; (b) their seasoning; (c) their special properties and the uses dependent thereon; (d) their geographical distribution.
2. Nails and screws—some of the kinds in common use, and their particular uses.
3. Tools⁽²⁾—their form, structure, and manipulation.

B. Drawing.

Isometric projections and working drawings—plans and elevations—of the specified exercises.

C. Bench-work.

1. Measuring and lining on suitable wood.⁽³⁾ Tools: 2ft. rule, square rule, try square.
2. Sawing to line across the grain on suitable wood,⁽³⁾ not more than $\frac{1}{2}$ in. thick. Tools: In addition to the above, bevel and tenon saw. Models: Some such test of the exercise as glueing pieces to imitate parquet flooring (for instance, the herring-bone 3in. by $1\frac{1}{2}$ in. by $\frac{1}{4}$ in.).
3. Sawing to line in any direction on suitable wood,⁽³⁾ not more than $\frac{1}{2}$ in. thick. Tools: In addition, the marking-gauge and panel-saw. Joints and models: Open box, or soap-box, or small bracket—butt joints, glued.
4. Planing. Wood for "trueing up" generally should not exceed 2ft. by $1\frac{1}{2}$ in. by $1\frac{1}{2}$ in. Tools: In addition, jack-plane, smoothing-plane. Joints and models: Such as halving joint at end. Square and triangular frame halved joints.
5. Boring, nailing, and screwing. Tools: In addition, bradawl, gimlet, hammer, screwdriver. Joint and models: Such as nail-box, simple bracket, &c., butt joints.
6. Hand-chiselling and plain chamfering with chisel and plane. Tools: In addition, firmer chisels. Joints and models: Such as Oxford frame, half-lap joints.
7. Mortise-chiselling. Tools: In addition, mortising-chisels. Joints and models: Bridle joint, single mortise joint, dovetail-halving, common box dovetailing; any simple models involving above exercises.
8. Tool-sharpening. Instruction to be given in the sharpening of planes and chisels, but not saws.

The above syllabus is prepared for a year's work for the average boy of Standards V., VI., or VII. The boys who show greater aptitude will be allowed to proceed to more advanced exercises⁽⁴⁾

⁽¹⁾ Hard woods—oak, beech, elm, ash, walnut, teak, mahogany. Soft woods—Scotch pine, white-fir or spruce, yellow-pine, pitch-pine, cedar, bass wood.

⁽²⁾ Tenon-saw, panel-saw, jack-plane, smoothing-plane, chisels, bradawl, gimlet, two-foot rule, bevel, marking-gauge.

⁽³⁾ Yellow or white deal for practice, bass wood for specimen work.

⁽⁴⁾ Such as double mortise and tenon, oblique ditto, housing, haunched tenon, &c.

when the above have been thoroughly mastered. The examination at the end of the year to be confined to the syllabus, omitting the models.

With a view to secure the best possible results, as well as to test the characteristics of two styles of teaching, the Committee determined upon engaging at least one assistant schoolmaster who held a certificate of having been trained in manual work. The school-management committee of the School Board consented to allow the permanent position of any teachers selected by the Joint Committee to be kept open for them. A circular was issued inviting applications from assistant teachers under the Board who had had experience in the class of work above described. There were thirty-three applications made by such teachers.

The Committee also decided that two practical artisans should be engaged to assist the instructors, and advertisements were inserted in the leading trade newspapers for candidates to fill the post of assistant instructor, in answer to which thirty-two applications were received. The Committee being of opinion that there might possibly be among those who applied for the post of assistant instructor some candidates with the necessary qualifications for the post of instructor, examined these candidates with a view to their suitability for the higher post. One of the candidates appeared to possess such qualifications, and he was transferred to the list of candidates for the post of instructor.

Ultimately, an assistant-master at one of the Board schools, and a practical artisan, who had already had twelve years' experience in science and art teaching, and held various high-class certificates, were appointed instructors. During the second year the first-named instructor (Mr. C. Pearson) resigned, owing to his being appointed instructor in applied drawing under the Liverpool School Board. The latter (Mr. S. Barter) was then appointed organizing instructor for the whole of the classes. For some time afterwards he divided his time between the work of the Joint Committee and in preparing for the establishment of manual-training classes under the Board; and, owing to provision being made in the (then) new code for manual training to be conducted at the expense of the school fund of the Board, he was, in 1891, appointed as organizing instructor exclusively under the Board, although he continues to advise the Joint Committee. Seven carpenters and joiners and one boy who is being trained by the Committee are employed as assistant instructors.

Two schemes for drawing boys from their respective schools to attend the manual-training classes were suggested. One of these was that of holding the manual-training classes at such hours of the day as would enable the pupils to give up about an hour of the regular school time, twice a week, and to extend the manual training into a period beyond the usual school-hours. The other was that of attending the manual-training classes once a week during the whole of a morning or afternoon, and thus give up one school attendance per week, in order to devote a complete half-day to the work of manual training. The latter plan offered the advantage of withdrawing each boy from his ordinary lessons only once, instead of twice, in each week; and, also, that of making his lesson in manual training more continuous. The headmasters who conferred with the Committee acquiesced in this course, which has been fully justified by the result.

Under this plan a class is conducted at a particular centre from 9 to 12 in the morning, and is attended by twenty boys, who are drawn from surrounding schools within a radius of about a mile. In the afternoon of the same day a second class is conducted, and it is attended by another set of scholars. Each of the following centres are occupied during the five working-days—from 9 to 12 in the morning, and from 2.30 to 4.30 in the afternoon: Broad Street, Ratcliff; Summerford Street, Bethnal Green; Vittoria Place, Barnsbury; Sumner Road, Peckham; St. Andrew's Street, Wandsworth Road, "Alma," Bermondsey; and Central Higher Grade Schools, 63, High Street, Marylebone.

The actual attendance varies month by month, but may be taken as averaging about 90 per cent. of the possible attendances.

The workshop in each case consists of a single room. The one at St. Andrew's Street was planned at the time of the school being built, with a view to its being ultimately used as a technical room. At Broad Street, Ratcliff, and at Sumner Road, Peckham, outbuildings in the playgrounds have been utilised and fitted up. At Vittoria Place School a disused building belonging to the Board is occupied. At Summerford Street part of the premises provided for the ordinary school accommodation is used for a manual-training class, subject to being given up whenever the Education Department should deem it necessary. A class-room at the "Alma" School was similarly occupied, but after it had been used for several months the Board, upon the requirement of the Education Department, withdrew the permission given by them to the Joint Committee. The Board granted the use of an iron building not then required for other purposes; this building is now erected, and adjoins the school.

In August, 1892, the Central Higher Grade School, South Marylebone, was, by arrangement with Canon Barker, added to the original six woodwork centres under the charge of the Joint Committee, thus making a total of seven centres.

For the equipment of each of the seven centres, the Committee have had carpenters' benches erected, fitted with vices and other necessary attachments. The benches, varying in size in proportion to the number of scholars which the room will accommodate, are about 14ft. long and 2ft. wide.

As the aim of the Committee is to employ twenty boys, as nearly as possible, at one time in each separate class, the approximate arrangement is to have five benches with six vices to each. Each boy has the use of a set of tools which cost 15s.

In addition, there are the general tools, which have to be used in common, the cost of which is about £10 16s. for each centre. The benches (five, more or less) cost from £4 16s. to £6 3s. 6d. each, according to size. There are also tool-baskets, tool-cupboards, sawing-stools, and some trifling additions, the cost of which is comparatively nominal. To assist in giving the pupils an intelligent idea of the instruction which they receive, the Committee directed the organizing

instructor to collect suitable specimens of woods to form two museums—one for each centre on the north and the south of the Thames respectively. These specimens have been suitably labelled, and have cost £12 in all. The organizing instructor has also constructed specimen joints to be used at each centre.

The regularly-recurring expenses for these woodwork classes include monthly salaries, which amount to about £650 during the year, for the organizing instructor and his assistants; also, materials, equipment, &c., which costs not exceeding £15 per annum for each centre.

About 1,450 boys are under instruction in the woodwork classes of the Joint Committee, and are working to the syllabus adopted by the Committee, and the progress, as evidenced by the results of the annual examinations, is eminently satisfactory.

The following is the report of the examiners on the examination held in November, 1894:—

“The written work on the whole was satisfactory, but somewhat uneven. The class attended by the boys numbered 61 to 80, for instance, showed far and away the most intelligent knowledge of their subject. In this section only one single slip was made in naming the woods (Question I.), and not only were nearly all the questions answered, and answered well, but several of the boys attempted more than their instructions warranted. There were a few exceedingly good papers too in some of the other classes, notably those of 8, 16, and 128; but many showed striking evidence of superficial teaching, instead of educational training. The why and the wherefore of things seem not to have been sufficiently attended to; and accurate observation does not appear to have received much attention. Nearly all the boys worked the drawings, and very few fell below good, while a large proportion were excellent.

“The practical work was certainly good—on the average, better than last year, and the work was more even; for, though there were fewer first-class boys, there was not many failures. The planing was very good almost throughout, but the sawing did not reach the same standard. The gauging was fair, but the paring with the chisel was inferior. Less mistakes were made than usual.”

(b.) *Saturday Classes for Teachers.*—With a view to more widely extending the instruction in manual training, and including it in the curriculum of a large number of schools, the School Board for London obtained permission from the Joint Committee to allow several assistant teachers in their schools to undergo a training for three months under the organizing instructor of the manual-training (woodwork) classes; and some teachers availed themselves of the privilege, leave of absence from their ordinary duties having been granted by the school-management committee.

It is gratifying to know that a number of other teachers have manifested their interest in fitting themselves for the woodwork classes established and to be established by the Board, by forming voluntary evening-classes, under the control of the organizing instructor, for the conducting of which the Joint Committee readily granted the use of tools, benches, &c., at the St. Andrew's Street, Wandsworth Road, and other centres. For the past two years the Joint Committee have had under their control these classes for teachers in woodwork. The teachers are prepared for the examinations (first year and final) of the City and Guilds of London Institute. The examinations are held by the Institute in June annually. In 1893 there were seventy-two certificates (first and final years, first and second class) awarded, and in 1894 there were seventy certificates (first and final years, first and second class) awarded.

The centres where instruction to teachers in woodwork is given are:—

Halford Road Board School, Fulham: Saturday, 9.30 to 12.30. St. Andrew's Street Board School, Wandsworth Road: Saturday, 9.30 to 12.30. Vittoria Place Board School, Barnsbury: Saturday, 9.30 to 12.30.

The following is the report of the examiners of the City and Guilds Institute upon the examinations held in 1894:—

“In the practical woodworking examination the general level is considerably higher than last year, the chief weakness being shown in the lack of practical knowledge of the principles of construction. Very many of the exercises were commenced the wrong way, and, as a consequence, the work was less neat and accurate than it otherwise would have been.

“The drawing to scale was better than at last year's examination; comparatively few mistakes have been made by marking off wrong dimensions. It is, however, evident that a great number of the candidates had little or no special preparation in drawing; the final lines of the drawing, instead of being definite and of uniform thickness and darkness, being, as a rule, imperfect and indistinguishable from the construction lines. In the first year's examination, of the candidates who failed, 40 per cent. failed in both drawing and practical woodwork, 8 per cent. in the practical examination, while 52 per cent. failed in drawing alone. In the final examination the drawing was better. Of the candidates who failed, 27 per cent. failed in drawing and one other division, and 19 per cent. in drawing alone.

“As regards the written examination, the average results were much in advance of those of last year. It is a curious fact that, whereas manual training is intended to promote habits of observation and to secure accuracy, it is in these very points that the candidates have most failed. The majority appear to have gained their knowledge of tools and timber from books instead of from the things themselves. Questions 6, 7, and 11 were the least well answered. Opinions were fairly divided as to which substance, steel or wood, possesses the greater elasticity, and few of the candidates seemed to appreciate the fact that to work from a drawing is a higher mental training than to work from a model, necessitating closer attention and more sustained thought.”

METAL-WORK.

(a.) *Day-classes for Boys.*—In April, 1892, the Joint Committee had under their consideration the question of extending their existing scheme of manual instruction, especially in the direction of including working in metals, to be conducted upon somewhat the same lines as the then existing classes in woodwork. For the purpose of examining all the best methods of work, they directed the clerk to communicate with the leading technical schools, not only in England, but upon the

Continent, asking them to furnish details of the various modes of instruction carried on in their schools. In answer to this appeal the following School Boards and schools forwarded information for the use of the Committee: Sheffield School Board, Birmingham School Board, Liverpool School Board, Manchester School Board, Nottingham School Board, City and Guilds Institute, People's Palace Technical Schools, United Westminster Schools; L'École Municipale, Diderat, Paris; Municipal Schools, Chemnitz, Germany; L'École Professionnelle (Rheims); Allan Glen School, Glasgow; German Union, Leipsic; Polytechnic, Regent Street, W.; and Canon Barker's Metal-working School, South Marylebone.

The Joint Committee, having considered the various schemes as adopted by these School Boards and schools, instructed the clerk of the Joint Committee and the organizing instructor in manual training to visit—(a) the Allan Glen School, Glasgow; (b) the Central Higher School, Sheffield; and to report upon the work carried on there.

In May, 1892, the report of the clerk of the Committee and the organizing instructor was submitted to the Joint Committee, and the following syllabus of instruction in metal-work for boys was then determined upon:—

DRAFT TENTATIVE SYLLABUS OF ELEMENTARY METAL-WORK.

Theoretical Work.

1. Drawing: Drawing of tools used, and exercises to be performed. 2. Object-lessons—Materials: Metals generally, and those used in the course in particular; chemical and physical properties and uses; method of manufacture; source of supply.

Practical Work.

1. Cutting simple objects from zinc plate. 2. Chipping cast-iron—(1) narrow flat surfaces; (2) broad flat surfaces. 3. Filing cast-iron—(1) narrow flat surfaces; (2) broad flat surfaces. 4. Chipping and filing concave surfaces. 5. Bending cold wrought strip iron into (1) simple and (2) complex curves. 6. Drilling. 7. Very simple turning. 8. Riveting. 9. Bending hot wrought bar-iron. 10. Shaping hot wrought bar-iron into simple forms. 11. Cutting forms from thin saw-steel plate, such as a pair of callipers to be heated in forge, filed, drilled, riveted, and finished. 12. Soldering zinc and tin plates. 13. Metal-spinning (zinc or "Britannia" metal).

Negotiations were entered into with Canon Barker with a view to renting the premises used as a metal-workshop at the Central Higher Grade Schools, Marylebone, and, satisfactory arrangements having been made, the Joint Committee commenced their classes in metal-working on the 22nd August, 1892, at these schools. All the schools surrounding the Marylebone Centre, both Board and non-Board, within the radius of one mile and a half were communicated with, asking them to send boys who had passed through a course of woodwork lessons to attend the metal-work classes. In May, 1893, a gas-engine, for the purposes of providing motive-power for the lathes, was provided, at the expense of the Joint Committee, for the Marylebone Centre. This metal-work centre affords accommodation for 140 boys, and is open for five hours a day during five days a week. These classes are conducted by an instructor of metal-work, under the direction of the organizing instructor in manual training. The organizing instructor furnishes the committee with a report each month, and also with a table of attendances. In November, 1892, the first examination was held, for which twelve boys presented themselves, the highest number of marks gained being 282, out of a possible 300. Two first-class prizes of £1 5s. each were awarded. In November, 1893, the second examination was held, for which twelve boys presented themselves, the highest number of marks gained being 246, out of a possible 300. In November, 1894, the third examination was held, for which twelve boys presented themselves, the highest number of marks gained being 252, out of a possible 300.

The following is the report of the examiners on the examination held in November, 1894:—

"The written examination does not give very satisfactory results. Questions 3 and 4 were on the whole well answered. Question 2 was moderately well answered by a few boys, but this was all. No boy knew anything about 'grey pig-iron' and 'white pig-iron,' none knew of any impurities common in iron and steel, and only two knew the meaning of the term 'reduction' as applied to the separation of a metal from its ore.

"The drawing, however, was exceedingly good throughout. The practical work was further advanced than last year. The boys were given 'chipping' and 'filing' cast-iron, and 'forging' an iron bar. 'Chipping' and 'filing' was very good; the 'forging' was not so successful. The iron in most cases was too much heated, which left the work scaly and rough. The two boys who took metal 'turning' did their work remarkably well. The boys set about their work very methodically, and handled their tools well."

(b.) *Classes for Teachers.*—The joint committee, deeming it advisable that classes should be formed for training teachers as metal-work instructors, classes were held in the metal-workshop of the Central Higher Grade Schools, 63, High Street, Marylebone, commencing on Tuesday evening, 2nd October, 1894, from 7 to 9.30 p.m.; and on Saturday morning, the 6th October, 1894, from 9.30 a.m. to 12 noon respectively. A fee of £1 11s. 6d. was charged for the whole course.

LAUNDRY-WORK.

Evening- and Day-classes for Teachers.—In October, 1892, evening-classes in laundry-work were established for training teachers and others as laundry instructors. The course of instruction extends over a period of about twenty-two weeks. Instruction is given two evenings per week, and on Saturday mornings, at various centres. These classes are held under the supervision of the Board's superintendent of instruction in laundry-work, and the instruction is given by three of their instructors.

In May, 1893, an examination both in theoretical and practical laundry-work was held. Twenty-nine students presented themselves: ten passed first class, fifteen passed second class, and four failed to satisfy the examiner.

In March, 1894, an examination in both theoretical and practical laundry-work was held. There were twenty-three students who presented themselves for examination; three passed first class, and twenty passed second class; certificates of proficiency, recognised by the Education Department, were awarded. Some of these students have been appointed by the School Board for London as teachers in laundry-work.

The following is the report of the examiner on the examination held in 1894: "I am glad to be able to give a most favourable report of the papers on the theory of laundry-work. They give evidence of thorough knowledge and a good, clear method of explaining it. These students have evidently studied the subject with real interest, and are likely to make interesting teachers."

HOUSEWIFERY.

Classes for Girls.—The Joint Committee have also established classes for instructing girls in housewifery. The Drapers' Company generously gave the sum of £250 to establish and equip these classes, and to maintain them for one year; and they promised a further sum of £250 (as part of the gross sum of £1,000 for manual-training purposes) to pay for the maintenance for at least another year. The School Board, through the works committee, prepared premises connected with the Board School at William Street, Hammersmith, and fitted three rooms—one as a bedroom, one as a living-room, and one as a kitchen—the necessary fittings and apparatus for teaching purposes being supplied. On the 4th July, 1891, the classes were inaugurated at a public meeting held at the school by the chairman and several members of the Joint Committee; and demonstrations in the practical work of washing and ironing, making beds, lighting fires, cleaning and dusting rooms, arrangement of furniture, setting breakfast- and dinner-tables, cleaning cutlery and fire-irons and fenders, black-leading grates, and the general routine of a day's work in the house of a working-man, were given under the direction of the instructor and her assistants. There have been about three hundred girls passed through the housewifery classes. These classes are held on Saturday mornings only, and are attended by twenty to thirty girls.

The aim of the lessons is to give the girls such *practical* knowledge of domestic work as may fit them in the future to conduct their homes creditably. The instructor exercises her discretion in apportioning the subjects, but the classes are worked more or less to the following syllabus:—

SYLLABUS FOR THE TEACHING OF HOUSEWIFERY.

First Stage—Every Day's Work.

Lesson I.—(1) Guiding principles to insure health and happiness; (2) selection of a house—drainage, sanitation; (3) hints on the furnishing of the home.

Lesson II.—(1) Chief items of a week's household work; practical work; lighting a fire and tidying the hearth and living-room.

Lesson III.—(1) An ordinary day's work in a working-man's home; (2) rules for setting a breakfast-table; (3) practical work; laying breakfast-table; revision.

Lesson IV.—(1) The composition of the air we breathe; (2) different impurities; (3) simple methods of ventilation for home, illustrated and explained.

Lesson V.—(1) The importance of airing a bed, directions for the same; (2) rules for bed-making; (3) practical work, making a bed.

Lesson VI.—(1) The principles involved in the variety and selection of foods, their preparation and arrangement for meals; importance of regularity in meals; rules for eating, and behaviour at table; (2) directions and practice in setting the dinner-table.

Lesson VII.—(1) Tidying the kitchen; (2) rules for the tea-table; (3) making the tea; (4) washing dishes, glass, pots and pans.

Lesson VIII.—(1) Cleaning windows and sills, various methods; (2) cleaning entrance, door-steps, and passage; (3) written examination.

Lesson IX.—Revision of the whole of first stage, and questions on the same; recapitulation of the practical work.

Second Stage—Special Work for Regular Days.

Lesson X.—(1) Directions for cleaning a bedroom; (2) sweeping an uncarpeted room; (3) practical work on the same.

Lesson XI.—(1) Dust, its several kinds, the harm it may do; (2) directions for dusting; (3) practical work.

Lesson XII.—(1) Cleaning water-bottles, hair-brushes, and marble; (2) practical work on the same.

Lesson XIII.—(1) Black-leading a grate; (2) cleaning fender and fire-irons, both steel and brass; revision of Lesson II.—first stage; (3) practical work.

Lesson XIV.—(1) Cleaning a sitting-room; (2) sweeping a carpeted floor; (3) directions for cleaning linoleum and oilcloth; (4) practical work.

Lesson XV.—(1) Brushing of furniture; (2) how to make furniture-polish; (3) directions for the polishing of furniture.

Lesson XVI.—(1) Cleaning lamps; (2) precautions in using lamps and oil; (3) suitable lamps; (4) how to put out a fire from a lamp being upset.

Lesson XVII.—(1) Kitchen-work, such as boot-cleaning, cleaning of knives and silver; (2) practical work.

Lesson XVIII.—Continuation of kitchen-work, including the scrubbing of tables, the cleaning of steps, the removal of kitchen refuse, &c

Third Stage.—Some Practical Rules for promoting Health and Happiness in the Home.

Lesson XIX.—(1) Thrift; the necessity for saving; (2) some safe ways of investing money, such as are offered through the Post Office.

Lesson XX.—(1) Personal cleanliness and home tidiness, necessity of, aids to, and advantages from; (2) revision of second stage.

Lesson XXI.—(1) Recreation, its various forms; the best forms of exercise, and their effect upon the body; (2) recreation of the mind, its necessity and effects.

Lesson XXII.—Oral examination and revision of theoretical and practical work of the three stages.

Two courses of lessons are given during the year, and two examinations are held annually. The only centre where instruction is given to girls in housewifery* is—

William Street Board School, Hammersmith—Nearest railway-station, Addison Road (Metropolitan Railway); on Saturdays only, from 10 a.m. to noon.

The following is the report of the examiner on the examination held in July, 1894: "This class has been most satisfactory, and the verbal replies to questions put during the practical work showed a thoroughly intelligent acquaintance with the reasons for all they were doing. Out of the fourteen questions set, only two were unanswered by four girls, and one by two others, while the far greater number answered all, and well within the given time. No one question seemed a special difficulty; the omissions were very varied. A fifteenth question about a sick-room was withdrawn, as that subject had not been included in their lessons; still, it was intelligently answered by six of the candidates. The class has been well taught, and was quite up to the number of questions that were set, and to the practical work required to be done. The girls showed great pleasure and interest in their work. One girl obtained all the marks possible, and a girl of ten years of age only fell short by thirteen."

The Joint Committee, in addition to having given instruction in housewifery to girls, have trained six assistant-mistresses, who are now capable of giving instruction in the subject.

FINANCIAL.

The Drapers' Company and the City and Guilds of London Institute still continue to render generous financial assistance to the Joint Committee. In 1894 the Drapers' Company kindly gave £1,000, and the City and Guilds Institute £250. These sums are augmented by grants from the Science and Art Department on the result of examinations of boys trained in the classes of the Joint Committee. The income of the Committee is, approximately, about £1,400 per annum.

The following analysis shows the actual expenditure during the year ended 31st December, 1894: Woodwork, £818 18s. 5d.; metal-work, £263 18s. 11d.; housewifery, £48 4s.; laundry, £71 18s. 9d.; sundries, £165 9s. 1d.: total, £1,368 9s. 2d.

DISTRIBUTION OF PRIZES.

The Worshipful Company of Drapers have, since the year 1892, given the use of their hall to the Joint Committee every year for the purpose of holding the annual distribution of prizes. The prizes, consisting of bags of tools and instruments and books for boys, and work-boxes and desks for girls, have been presented to the students yearly by distinguished persons—this year by Lady George Hamilton (accompanied by Lord George Hamilton), on Tuesday, 5th March, at the seventh annual distribution of prizes.

GENERAL.

It is gratifying to the Joint Committee to know that the system framed by them both in respect of its syllabus and method of administration has been widely adopted in provincial towns and abroad; and, further, that several of the more prominent instructors in the provinces have had their training under the Committee.

The organizing instructors evince a strong earnestness in their work, and the teachers and children who have been trained under the Joint Committee have felt the deepest interest in their work, and have made steady progress.

Several gentlemen (members of Parliament, educationists from various parts of the United Kingdom and also from foreign countries, members and clerks of provincial School Boards, head-teachers of middle class and of public elementary schools, and others) have paid visits to some of the centres, and have expressed their approval of the instruction.

In addition, it is pleasing to note that parents express great satisfaction with the influence exercised by this instruction in manual training upon their children, and the zeal manifested by the scholars in connection with it. There appears to be a healthful spirit of emulation among the pupils. As the moneys contributed for the work are from sources outside the funds of the Board, facilities are offered for children from non-Board schools to avail themselves of the privilege of attending the classes of the Joint Committee.

* Since the date of this report a centre for teaching housewifery to children in the fourth and higher standards has been opened at Beresford Street, Walworth.

Approximate Cost of Paper.—Preparation, not given; printing (1,450 copies), £13 5s.