1907.
NEW ZEALAND.

EDUCATION:
MANUAL AND TECHNICAL INSTRUCTION.

[In continuation of E.-5, 1906.]

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

No. 1.

EXTRACT FROM THE THIRTIETH ANNUAL REPORT OF THE MINISTER OF EDUCATION.

A REVIEW of the year's work discloses a very considerable advance throughout the colony in respect of matters connected with manual and technical instruction. In the larger centres controlling authorities have been enabled by means of Government grants to continue the work of extending and improving the provision already made for technical instruction, with the result that a general improvement is noticeable, not only in the range and character of the instruction, but also in the efficiency of the accommodation and equipment for classes. Provision is also being made, as far as circumstances (local and otherwise) warrant, for accommodation and equipment for classes in a number of smaller centres in which facilities for technical instruction have been previously lacking. Evidence is not wanting that on the whole the classes so established are being taken advantage of by those for whose benefit they have been initiated. In the case of some of the technical schools in the larger centres steps have been taken to establish subcentres, many of the classes being conducted by itinerant instructors or by instructors on the staff of the technical school. This system, which has much to commend it, makes for greater efficiency in the matter of instruction than would otherwise be the case, and further enables the authorities of what may be termed the parent schools to find full employment for some at least of their instructors. The establishment in certain centres of technical day classes, in addition to the usual evening classes, to which reference was made in last year's report, has also done much to improve the teaching-strength of the staffs of the technical schools concerned. Far better results are likely to accrue where instructors are able to give their whole time to the work, instead of, as has too often been the case hitherto, being employed in giving instruction for one or two evenings a week only. With regard to the technical day classes, which are attended mainly by holders of free places, there is one feature that appears to call for special mention, and that is the very large number of pupils taking courses in commercial instruction compared with the number of pupils taking courses in other subjects of technical instruction. Without going into the reasons, which are sufficiently obvious, for this not altogether satisfactory state of affairs, let it suffice to say that this undue preponderance of classes for commercial instruction is to be regretted. The continued efforts on the part of those responsible for the conduct of the larger technical schools in the direction of inducing students to take up definite courses of instruction in lieu of isolated subjects are meeting with a greater measure of success than heretofore. In spite of the many real difficulties to be contended against, it has been found possible to arrange in certain cases for fairly complete courses of instruction for those engaged in important and widespread industries and trades. The schools have been assisted in this very important matter by the improved attitude of employers, who appear to have begun to realise that it is to their benefit to encourage their employees to avail themselves of the opportunities now offered for obtaining a knowledge of the principles underlying the practice of the industry or trade with which they are immediately concerned. There is abundant evidence that an increasing interest is being taken by local bodies and employers of labour in the institutions devoted to technical instruction, the effect of which cannot be other than beneficial to the cause of technical education in the colony. As evidencing the interest referred to, it may be remarked that the amount paid by the Government during the year by way of subsidies on voluntary contributions in aid of technical instruction was nearly two and a half times as much as for the previous year. The number of approved technical, continuation, and school classes in operation during the year was 5,012, as against 3,945 for the previous year. Of these classes 3,839 were classes for instruction in various branches of handwork in connection with nearly a thousand primary and secondary schools, while 1,173 were special, associated, and college classes for instruction in various subjects of science, art, and technology. Technical classes were held at about seventy-eight different places.

An increasing amount of attention continues to be given to instruction in handwork in connection with primary and secondary schools. Cookery and woodwork, among other subjects, are now being taught in nearly every education district. During the year 214 cookery classes and 188 woodwork classes were in operation. These classes are taught usually at properly equipped central schools. This system, though not without disadvantages, has much to commend it. It has the merit of economy, and thus enables controlling authorities to arrange for the instruction of a much larger number of children than would otherwise be the case. Considerable attention is also being given to instruction in primary schools in subjects relating or leading up to rural pursuits. A large number of schools—over three hundred—are now provided with gardens and experimental plots, affording excellent opportunities for gaining a little knowledge at first hand by bringing children into contact with things rather than with other people's description of things. The action of certain controlling authorities in appointing special instructors to train the teachers and to supervise the work in the schools should do much to increase the value of what is a most important factor in the all-round education of the child. When it is remembered that until recently facilities for the training of teachers in rural science were almost if not entirely absent, it is pleasing to be able to record the fact that the work accomplished in connection with not a few of the school gardens has been distinctly beneficial to the general work of the school. In two education districts, in addition to school gardens, instruction is now being given in the principles connected with the processes common to dairying, and to a smaller extent in the processes themselves, with gratifying results. As a result of this preliminary training in the schools, controlling authorities should experience little difficulty in arranging later on for more specialised instruction in connection with classes for young people who have left school not unacquainted with some at least of the facts of their surroundings.

The special grants to Education Boards for the training of teachers in subjects of manual and technical instruction have been continued this year. The grants have, on the whole, been wisely used, and full advantage has been taken by teachers of the opportunities provided for instruction. The curriculum of the training-colleges in the four large centres also includes instruction in various branches of handwork. At the examinations of the City and Guilds of London Institute thirty-eight teachers passed the examination in cookery, and twenty-nine that in woodwork.

Free places at technical schools were held by over 1,600 persons, as against about 1,000 for the previous year. A fair proportion of holders of junior free places have qualified by examination for senior free places, entitling them to three years further free education, at the end of which period they should have passed through a fairly complete course of technical instruction.

The specimens of handwork from public and secondary schools, and of the work of some of the technical and art schools, exhibited at the International Exhibition at Christchurch afforded an opportunity of gauging to some extent the value of what is being done in the way of manual and technical instruction in the colony. The exhibits, though not as representative as they might have been, gave in many instances evidence of sound instruction and of progress along right lines.

The total expenditure by the Government on manual and technical instruction for 1906 was £63,416 2s. 3d. The details are as follows: Capitation on all classes, £25,363 1s. 2d.; grants for buildings and equipment, £24,905 3s. 11d.; grants for material for class use, £951 4s. 4d.; subsidies on voluntary contributions, £3,225 15s. 11d.; training of teachers in subjects of manual and technical instruction, £2,415; training-colleges on account of instruction in handwork, £923 12s. 5d.; railway fares of instructors and students, £647 9s. 5d.; expenses in connection with the examinations of the Board of Education, South Kensington, and of the City and Guilds of London Institute, £701 0s. 2d.; inspection, £899 19s.; free places, £3,336 0s. 7d.; sundries, £47 15s. 4d. The sum of £160 12s. 6d. was recovered by way of examination fees and from sale of material used at examinations, leaving a net expenditure of £63,255 9s. 9d.

No. 2. DETAILS RELATING TO MANUAL AND TECHNICAL INSTRUCTION.

TABLE A.—MANUAL AND TECHNICAL INSTRUCTION, 1906.—SPECIAL, ASSOCIATED, AND COLLEGE CLASSES.

School or Classes.	Number of Classes.	Subjects of Instruction and Average Attendance.																							Payments up to 31st December, 1906.			
		Freehand (from the Flat and Round), Light and Shade.	Plane and Solid Geometry, Perspective, Practical Geometry.	Design and Ornament.	Drawing, Modelling, and Painting from Antique and Nature.	Architecture and Building-construction.	Mechanical Drawing and Machine-construction.	Practical Mechanics and Mathematics, Surveying.	Mechanical and Electrical Engineering.	Experimental and Natural Science (Chemistry, Physics, Botany, Agriculture, Photography, &c.)	Woodwork and Ironwork.	Wood-carving, Modelling, and *Repoussé* Work.	Carpentry and Joinery, Cabinetmaking, Painters' and Decorators' Work, Coachbuilding.	Plumbers' and Tinsmiths' Work, Iron and Brass Moulding.	Smithing.	Cookery and Laundry-work, Dressmaking, Millinery, Tailoring.	Wool-sorting.	Commercial Subjects.	English, Latin, French, German, Maori, Arithmetic.	Music, Singing, and Elocution.	Training-classes for Teachers in Elementary Handwork, Woodwork, and Cookery.	Training-classes for Teachers in Drawing.	Training-classes for Teachers in Physical Measurements, Elementary Agriculture, and Nature-study.	Totals.	Capitation.	Grants for Buildings, Furniture, and Apparatus.	Grants for Material.	Pound-for Pound Subsidy on Voluntary Contributions.
																									£ s. d.	£ s. d.	£ s. d.	£ s. d.
Auckland Education Board—																												
Technical College, Auckland	143	57	46	..	..	28	144	274	74	132	17	..	54	85	3	132	..	772	401	..	20	360	..	2,599	906 2 2	110 15 6	88 6 9	83 9 0
Technical classes, Onehunga	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10	..	..	..	..	..	..	..	10	18 10 3	..	..	..
" Dargaville	12	7	..	..	13	..	..	..	..	..	..	..	..	..	..	11	..	22	13	..	..	14	..	80	131 1 11	9 10 0	..	5 16 0
" Aratapu	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	..	9	10 18 5	..	..	..
" Whangarei	25	21	..	..	12	6	..	3	..	14	..	..	14	..	..	9	..	51	33	..	18	..	53	234	232 4 2	39 17 1	1 2 3	14 0 8
" Hikurangi	12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11	..	38	11	..	..	..	35	95	..	11 10 0	..	..
" Kamo	10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	53	24	..	..	..	..	77	13 15 4	..	..	..
" Whakapara	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	15	..	..	..	..	15	..	..	..	..
" Te Kopuru	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	12	..	..	..	..	..	..	..	12	..	9 10 0	..	..
" Thames	23	..	9	..	..	..	9	14	..	..	..	..	7	..	..	37	..	55	174	..	12	..	..	317	357 8 5	501 10 0	..	254 3 9
" Waihi	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	13	..	25	..	..	..	..	..	38	5 17 6	9 10 0	..	..
" Te Aroha	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	16	..	..	..	..	..	..	..	16	8 13 3	9 10 0	..	..
" Turua	8	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	20	17	..	..	..	..	42	17 9 5	..	..	..
" Paeroa	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	15	..	..	..	..	..	..	..	15	9 10 6	9 10 0	..	..
" Hamilton	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	25	..	..	..	..	..	41	45	111	69 0 0	54 14 5	..	..
" Cambridge	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8	30	38	39 12 7	33 16 11	..	..
" Waihou	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	14	..	..	..	..	..	..	..	14	..	..	..	..
"Elam" School of Art	17	349	41	..	117	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	507	444 16 6	17 18 0	..	150 0 0
Taranaki Education Board—																												
Technical School, New Plymouth	15	7	7	..	..	3	..	..	3	..	..	..	..	7	..	10	..	33	21	..	33	..	12	136	8 7 9	2,195 2 9	20 15 7	50 15 0
Technical classes, Stratford	14	17	..	..	..	..	..	..	..	..	..	12	..	..	..	12	..	..	47	..	70	20	20	198	53 6 1	22 0 10	2 5 9	..
" Opunake	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	5	5	15	..	..	..	..
Wanganui Education Board—																												
Technical School, Wanganui	78	8	43	10	67	9	10	..	26	27	9	64	13	34	..	57	..	345	367	23	64	..	42	1,218	915 3 5	1,075 15 10	15 7 10	88 15 0
Technical classes, Palmerston North	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	25	25	26 5 6	33 14 5	2 0 0	..
Technical School, Hawera	14	20	..	..	26	..	..	..	..	15	6	8	..	..	..	7	..	22	47	..	8	11	8	178	61 3 0	16 15 1	3 7 5	..
" Feilding	20	..	..	..	14	9	..	..	..	23	..	36	..	..	..	31	..	95	60	16	..	..	..	284	56 11 7	..	..	..
Technical classes, Waverley	2	..	..	..	..	..	..	..	..	..	..	10	..	..	..	..	..	..	..	..	..	..	..	10	4 1 0	..	..	..
" Hunterville	3	..	..	..	..	..	..	..	..	..	..	11	..	..	..	..	..	..	..	..	..	..	..	11	6 0 0	..	..	..
" Marton	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	27	..	..	..	..	..	12	13	52	16 6 3	..	..	..
" Taihape	5	..	..	..	..	..	..	..	..	..	..	21	..	..	..	10	..	10	..	..	..	..	..	41	6 8 3	..	..	..
" Eltham	10	..	..	..	..	..	..	..	..	25	..	..	..	..	..	30	..	47	18	..	..	..	..	120	45 13 4	..	..	..
" Mangaweka	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10	..	..	8	..	..	..	..	18	..	..	..	..
" Mangatoki	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	30	..	9	20	..	..	..	..	59	..	..	..	10 0 0
" Kaponga	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11	..	8	6	..	..	..	..	25	..	..	..	..

Table A.—Manual and Technical Instruction, 1906—continued.

School or Classes.	Number of Classes.	Subjects of Instruction and Average Attendance.																						Totals.	Payments up to 31st December, 1906.			
		Freehand (from the Flat and Round), Light and Shade.	Plane and Solid Geometry, Perspective, Practical Geometry.	Design and Ornament.	Drawing, Modelling, and Painting from Antique and Nature.	Architecture and Building-construction.	Mechanical Drawing and Machine-construction.	Practical Mechanics and Mathematics, Surveying.	Mechanical and Electrical Engineering.	Experimental and Natural Science (Chemistry, Physics, Botany, Agriculture, Photography, &c.)	Woodwork and Ironwork.	Wood-carving, Modelling, and *Repoussé* Work.	Carpentry and Joinery, Cabinetmaking, Painters' and Decorators' Work, Coachbuilding.	Plumbers' and Tinsmiths' Work, Iron and Brass Moulding.	Smithing.	Cookery and Laundry-work, Dressmaking, Millinery, Tailoring.	Wool-sorting.	Commercial Subjects.	English, Latin, French, German, Maori, Arithmetic.	Music, Singing, and Elocution.	Training-classes for Teachers in Elementary Handwork, Woodwork, and Cookery.	Training-classes for Teachers in Drawing.	Training-classes for Teachers in Physical Measurements, Elementary Agriculture, and Nature-study.		Capitation.	Grants for Buildings, Furniture, and Apparatus.	Grants for Material.	Pound-for-Pound Subsidy on Voluntary Contributions.
																									£ s. d.	£ s. d.	£ s. d.	£ s. d.
High School Board, Palmerston North—																												
Technical classes	16	63	..	..	4	..	..	..	..	8	..	22	..	48	..	..	..	13	7	..	..	..	..	165	38 6 6	..	27 15 8	67 16 0
Wellington Education Board—																												
Technical School, Wellington	144	465	30	31	99	21	84	144	131	37	52	..	162	90	..	6	..	1886	366	..	..	..	..	3,604	3,536 8 1	4,410 2 7	274 1 5	445 1 2
Technical classes, Wellington	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	17	81	..	98	..	..	26 11 8	..
〃 Masterton	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	34	34	6 13 9	52 6 11	9 1 1	..
〃 Carterton	4	8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7	7	..	..	..	..	22	36 0 0	..	..	..
〃 Greytown	1	..	..	..	..	..	..	..	..	17	..	..	..	..	..	..	..	..	..	..	..	..	..	17	..	..	6 0 9	..
〃 Eketahuna	2	26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	26	11 17 9	..		..
〃 Pahiatua	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7 1 9	..	..	...
Petone Technical Classes Association	9	..	13	..	..	..	6	..	..	7	..	..	6	4	..	8	..	16	37	..	..	..	..	97	84 11 0	54 9 0	..	80 0 0
Masterton Technical Classes Association	14	24	..	..	11	9	..	..	..	..	20	12	..	19	..	7	..	33	32	..	..	..	..	167	188 13 9	36 1 1	4 11 0	133 6 0
Hawke's Bay Education Board—																												
Technical School, Napier	17	..	..	..	..	7	..	..	..	..	37	..	7	12	..	79	..	28	17	..	..	..	46	233	145 0 6	103 6 8	48 10 2	487 10 0
Technical classes, Hastings	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	16	..	12	..	..	..	..	..	28	19 10 6	..	4 10 0	..
〃 Dannevirke	7	6	..	..	28	..	..	..	..	..	..	..	..	6	..	52	..	..	..	..	12	..	..	104	87 4 9	232 2 10	21 3 0	..
〃 Gisborne	3	..	..	..	..	..	..	..	..	..	9	..	..	..	..	25	..	..	..	..	..	..	..	34	25 5 9	..	..	..
〃 Woodville	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	..	..	..	..	..	..	..	5	2 11 9	..	..	..
〃 Waipawa	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	50 0 0
Board of Governors, Gisborne High School—																												
Technical classes	10	..	..	..	..	..	..	..	..	..	13	3	..	..	..	39	..	19	7	..	..	..	..	81	27 14 3	19 16 11	..	21 16 0
Marlborough Education Board—																												
Technical classes, Blenheim	7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	51	..	15	7	..	..	..	..	73	11 5 0	864 14 0	..	..
〃 Havelock	4	..	..	..	6	..	..	..	..	..	..	..	..	..	..	..	..	12	38	..	..	..	..	56	1 15 3	..	..	..
〃 Canvastown	7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	14	14	10	..	..	..	38	10 8 4	..	..	..
〃 Picton	2	6	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	3 8 3	..	..	..
Nelson Education Board—																												
Technical School, Nelson	30	5		..	18	4	3	..	..	9	21	16	..	13	..	25	..	30	61	..	..	48	..	253	216 8 3	344 2 1	29 9 5	..
Technical classes, Wakefield	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	21	..	5	..	..	..	..	..	26	2 11 9	..	..	..
〃 Reefton	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	13	..	..	..	..	..	..	..	13	6 2 6	..	..	..
〃 Westport	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	25 7 3	..	..	..
Grey Education Board—																												
Technical classes, Greymouth	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7 17 6	803 10 0	..	..
Westland Education Board—																												
Technical classes, Hokitika	3	..	..	..	..	..	..	..	..	..	22	..	..	..	..	..	..	20	..	..	..	..	17	59	12 14 9	141 14 9	..	..
〃 Kumara	1	..	..	..	..	..	..	..	..	..	22	..	..	..	..	..	..	..	..	..	..	..	..	22	69 13 1	..	..	..

Board of Governors, Canterbury College—																												
School of Art, Christchurch	47	104	30	54	168	62	..	..	..	..	..	207	28	..	..	..	..	..	..	..	..	..	..	653	556 18 6	36 9 6	7 4 8	..
School of Engineering, Christchurch ..	47	45	29	..	..	2	45	69	210	..	..	..	..	..	..	..	..	..	..	..	..	..	..	400	183 0 0	192 1 3	60 16 0	..
School of Domestic Instruction, Christchurch	12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	120	..	..	..	..	..	..	..	120	104 12 6	113 2 5	124 5 8	..
North Canterbury Education Board—																												
Christchurch Technical Classes Association	39	..	..	..	..	9	15	22	..	5	..	..	68	13	..	33	24	204	77	..	..	..	..	470	245 8 3	1,392 1 0	36 16 5	481 10 0
Technical classes, Normal School, Christchurch	6	..	..	..	..	..	..	..	..	..	10	..	..	..	..	..	..	..	..	..	18	12	52	92	12 3 3	..	..	..
Technical classes, Kaiapoi	4	..	..	..	..	..	..	..	..	..	9	6	..	..	..	28	..	..	..	..	..	..	..	43	38 19 3	29 8 6	..	..
" Leeston and Doyleston	4	..	..	..	..	..	..	..	..	..	11	7	..	..	..	17	..	..	..	..	..	..	..	35	70 16 0	..	..	..
" Southbridge ..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	20	..	..	..	..	..	..	..	20	28 1 0	..	..	..
" Lincoln	2	..	..	..	..	..	..	..	..	..	10	..	..	..	..	8	..	..	..	..	..	..	..	18	15 16 6	71 10 0	..	..
Continuation classes, Christchurch ..	7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	104	22	..	..	..	..	126	38 17 3	..	..	..
Akaroa Technical Classes Association ..	6	..	..	..	..	..	..	..	..	..	15	..	..	..	..	29	..	25	..	..	..	..	..	69	..	111 14 10	..	84 4 11
Rangiora " ..	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	31	..	24	..	..	..	..	..	55	43 19 9	8 0 0	..	20 0 0
Ashburton " ..	11	..	..	..	..	..	..	..	..	..	8	..	..	..	..	45	14	43	..	..	..	..	..	110	36 4 6	226 0 10	3 17 8	21 8 0
Lyttelton " ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11 13 0	40 0 0	..	10 0 0
South Canterbury Education Board—																												
Timaru Technical Classes Association ..	18	12	..	..	..	13	..	..	4	21	22	10	..	20	..	64	..	121	47	..	..	..	..	334	115 7 2	200 0 0	29 1 7	4 11 0
Waimate " ..	8	..	..	..	..	..	..	..	..	..	..	16	..	..	..	26	..	94	..	..	..	..	..	136	223 7 0	..	..	20 4 6
Temuka " ..	10	..	..	..	9	13	..	..	..	6	16	9	9	..	..	82	..	12	..	..	..	..	..	156	142 15 9	1,383 13 7	15 9 3	..
Pleasant Point " ..	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	24	22	21	..	..	..	..	..	67	..	..	..	15 7 0
Technical classes, Timaru	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	74	74	56 1 10	6 6 0	7 7 6	..
" Waimate	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8 17 0	..	..	..
Otago Education Board—																												
School of Art, Dunedin	50	237	109	7	82	9	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	450	353 1 3	..	..	..
Technical School, Dunedin	62	..	..	..	..	..	..	22	37	46	6	20	35	..	..	130	..	339	462	..	..	..	..	1,097	629 17 2	3,000 0 0	47 18 0	220 3 6
Technical classes, Dunedin	8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	203	203	81 6 3	..	..	..
Oamaru Technical Classes Association ..	26	..	..	..	..	..	..	..	..	44	..	..	21	..	..	50	..	119	23	..	..	..	..	257	204 2 11	277 11 10	15 16 1	81 1 0
Associated classes, Enfield	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	25	..	..	..	..	..	..	..	25	..	..	..	..
" Maheno	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	22	..	19	..	..	..	..	..	41	..	..	..	..
" Tokarahi	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	26	..	..	..	..	..	..	..	26	..	..	..	..
Technical classes, Oamaru	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	27	27	10 3 6	..	..	..
" Kaitangata	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	12	..	5	..	..	..	..	..	17	12 4 3	..	..	..
Southland Education Board—																												
Technical School, Invercargill	29	28	..	..	30	12	8	..	..	14	..	15	10	15	..	56	..	73	169	..	..	99	105	634	157 6 0	2,743 0 0	15 18 9	..
Technical classes, Gore	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	19	19	38	..	32 10 0	1 13 0	..
Country continuation classes	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	31	..	..	..	..	31	18 12 4	..	..	..
Totals	1173	1,520	357	102	707	216	330	548	485	450	335	505	434	366	3	1,735	60	4918	2706	49	277	739	865	17,707	11,448 10 9	21,086 17 5	951 4 4	2900 18 6

TABLE B.—MANUAL AND TECHNICAL INSTRUCTION, 1906.—SCHOOL CLASSES.

Controlling Authority.	Subjects of Instruction and Number of Classes in each Subject.														Payments up to 31st December, 1906.		
	Total Number of Schools.	Elementary Handwork.	Drawing in Light and Shade, Blackboard Drawing and Design.	Cookery.	Dressmaking.	Needlework.	Woodwork.	Elementary Science.	Elementary Physiology, Health, and First-aid.	Swimming and Life-saving.	Elementary Agriculture.	Dairying.	Elementary Physical Measurements.	Totals.	Pound-for-pound Subsidy on Voluntary Contributions. £ s. d.	Capitation. £ s. d.	Grants for Buildings, Furniture, and Apparatus. £ s. d.
Education Board, Auckland	163	402	133	65	..	28	68	2	1	27	64	..	2	792	26 5 0	3,187 15 1	1,299 0 0
Board of Governors, High School, Thames	1	..	4	1	1	..	1	3	..	..	..	..	..	10	..	28 7 7	29 8 6
Board of Governors, High School, Whangarei	1	..	..	1	..	..	2	..	..	..	..	..	..	3	..	35 4 9	..
Education Board, Taranaki	49	135	32	..	4	13	2	5	3	1	18	2	3	218	..	445 1 11	52 11 9
Board of Governors, High School, New Plymouth	1	..	1	..	1	..	..	1	..	..	..	..	..	3	..	21 11 3	1 5 0
Education Board, Wanganui	120	216	203	7	2	2	14	5	1	1	46	..	2	499	164 4 5	1,359 16 5	69 8 2
Board of Governors, High School, Palmerston North	1	..	3	2	..	..	2	7	..	..	1	..	..	15	..	82 15 2	55 0 0
Board of Governors, Wanganui Girls' College	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9 5 0	..
Education Board, Wellington	115	270	83	12	3	17	..	3	5	..	43	..	5	441	127 8 0	1,660 4 5	1,035 15 4
Board of Governors, Wellington Girls' College	1	..	3	..	..	..	..	5	3	..	..	..	..	11	..	..	..
Education Board, Hawke's Bay	36	46	38	31	16	6	23	2	3	1	5	..	..	171	..	1,097 11 5	544 9 0
Board of Governors, Napier Girls' High School	1	..	..	2	..	..	..	..	..	..	..	..	..	2	..	30 15 0	..
Board of Governors, Dannevirke High School	1	..	..	1	..	..	..	..	..	..	..	..	..	1	..	3 9 0	..
Education Board, Marlborough	24	44	14	8	..	3	..	..	2	1	10	..	..	82	7 0 0	172 3 1	11 15 0
Board of Governors, High School, Blenheim	1	..	..	..	..	..	..	7	..	..	..	..	..	7	..	12 15 0	26 15 6
Education Board, Nelson	45	67	14	7	7	15	2	..	13	10	3	..	..	138	..	604 2 10	27 6 0
Board of Governors, Nelson Girls' College	1	..	..	4	..	..	..	..	..	..	..	..	..	4	..	53 5 0	..
Education Board, Grey	4	14	..	..	..	..	2	..	..	..	..	..	..	16	..	11 7 0	69 12 7
Education Board, Westland	3	12	..	..	..	2	2	..	..	..	..	..	..	16	..	29 12 4	..
Education Board, North Canterbury	116	240	14	17	1	30	15	1	..	31	2	..	..	351	..	1,308 4 7	511 7 10
Board of Governors, Canterbury College—																	
Boys' High School	1	..	..	..	..	..	3	1	..	..	..	..	1	5	..	15 15 0	..
Girls' High School	1	..	3	2	2	..	..	9	1	1	..	..	..	18	..	44 13 1	..
Board of Governors, Ashburton High School	1	..	..	2	..	..	2	..	..	1	..	..	..	5	..	35 15 0	..
Education Board, South Canterbury	45	92	10	11	1	14	11	12	1	2	4	..	..	158	..	764 18 5	28 11 6
Board of Governors, Timaru High Schools—																	
Boys' High School	1	..	..	..	..	..	2	..	..	1	..	..	..	3	..	58 5 0	2 5 4
Girls' High School	1	..	..	..	1	..	..	3	..	..	..	..	..	4	..	29 7 6	..
Education Board, Otago	108	165	14	23	1	29	22	3	3	1	49	..	23	333	..	1,380 2 3	..
Board of Governors, Otago High Schools—																	
Boys' High School	1	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..
Girls' High School	1	..	..	2	..	..	..	..	..	..	..	..	..	2	..	49 7 6	..
Education Board, Southland	149	325	65	13	24	39	13	..	..	1	8	..	23	511	..	1,287 2 4	53 15 0
Board of Governors, Southland High Schools—																	
Boys' High School	1	..	..	..	..	..	2	2	..	..	..	..	..	4	..	21 7 6	..
Girls' High School	1	..	3	3	..	..	..	5	3	1	..	..	..	15	..	74 10 0	..
Totals	995	2,028	637	214	64	198	188	76	39	81	253	2	59	3,839	324 17 5	13,914 10 5	3,818 6 6

TABLE C.—RECEIPTS OF AND EXPENDITURE BY EDUCATION BOARDS AS CONTROLLING AUTHORITIES OF SCHOOL CLASSES ON MAINTENANCE OF CLASSES FOR THE YEAR ENDING THE 31ST DECEMBER, 1906 (EXCLUSIVE OF EXPENDITURE OUT OF SPECIAL GRANTS FOR BUILDINGS, EQUIPMENT, ETC.).

Subjects of Instruction.	Education District.							
	Auckland.		Taranaki.		Wanganui.		Wellington.	
	Receipts.	Expenditure.	Receipts.	Expenditure.	Receipts.	Expenditure.	Receipts.	Expenditure.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Elementary handwork	660 11 1	714 17 7	215 8 11	179 9 9	340 11 10	373 1 9	730 5 4	578 4 5
Needlework	108 12 9	108 12 9	63 5 9	68 17 9	153 14 6	157 8 9	97 15 0	101 19 0
Woodwork	986 17 9	1,230 5 6	21 10 0	7 2 0	220 17 1	269 17 11	..	..
Cookery	857 15 7	1,087 0 10	..	..	263 8 9	229 5 3	501 15 0	430 6 0
Dressmaking	..	..	3 2 0	2 9 4	17 5 3	17 5 3	12 15 0	7 0 2
Elementary agriculture	412 14 2	737 0 6	63 16 2	140 3 4	297 8 5	409 18 10	263 11 7	813 12 0
Dairy-work	..	..	36 13 3	8 13 5	..	..	..	..
Elementary physiology	7 10 0	2 6 0	8 7 6	..	2 9 6	2 10 0	23 0 0	0 13 6
Swimming and life-saving	121 1 1	61 0 0	..	4 0 0	23 6 1	23 6 1	1 5 0	..
Elementary physical measurements	15 0 0	..	22 10 0	16 18 0	29 10 0	..	16 5 0	15 4 10
Elementary science	17 12 8	..	10 8 4	4 9 1	11 5 0	10 3 7	13 12 6	16 12 3
	3,187 15 1	3,941 3 2	445 1 11	432 2 8	1,359 16 5	1,492 17 5	1,660 4 5	1,963 12 2

Subjects of Instruction.	Education District.							
	Hawke's Bay.		Marlborough.		Nelson.		Grey.	
	Receipts.	Expenditure.	Receipts.	Expenditure.	Receipts.	Expenditure.	Receipts.	Expenditure.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Elementary handwork	173 6 6	153 12 10	43 13 7	39 16 3	109 18 0	116 14 9	11 7 0	12 5 4
Needlework	27 0 0	27 0 0	15 0 0	19 12 0	85 5 9	89 0 9	..	..
Woodwork	307 13 6	334 18 0	..	..	25 10 0	29 15 8	..	16 1 0
Cookery	417 6 9	494 16 7	9 2 0	55 7 7	204 0 0	204 8 11	..	..
Dressmaking	90 16 6	87 15 10	..	..	30 0 0	44 18 0	..	..
Elementary agriculture	41 16 4	40 12 7	61 17 6	35 2 1	32 0 0	32 0 0	..	..
Dairy-work	..	..	..	..	..	..	..	..
Elementary physiology	6 7 6	9 9 0	42 10 0	29 14 4	96 8 7	70 2 2	..	..
Swimming and life-saving	1 10 0	..	..	..	21 0 6	0 11 6	..	..
Elementary physical measurements	..	..	..	..	..	1 5 0	..	..
Elementary science	31 14 4	30 18 2	..	..	..	..	..	..
	1,097 11 5	1,179 3 0	172 3 1	179 12 3	604 2 10	588 16 9	11 7 0	28 6 4

Subjects of Instruction.	Education District.									
	Westland.		North Canterbury.		South Canterbury.		Otago.		Southland.	
	Receipts.	Expenditure.	Receipts.	Expenditure.	Receipts.	Expenditure.	Receipts.	Expenditure.	Receipts.	Expenditure.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Elementary handwork	12 13 4	40 10 6	338 5 2	219 5 9	149 17 6	104 13 10	205 7 4	249 15 6	538 5 3	122 5 4
Needlework	7 9 0	..	198 5 9	199 14 6	89 12 0	89 12 0	155 7 0	153 12 8	198 19 7	198 19 7
Woodwork	9 10 0	9 10 0	210 7 0	170 17 8	236 11 2	228 12 5	269 16 8	277 18 1	81 0 0	220 0 8
Cookery	..	..	430 17 6	429 15 2	238 5 0	178 16 0	455 17 0	348 5 8	96 15 0	226 5 0
Dressmaking	..	..	2 19 2	2 19 2	9 7 6	..	..	..	106 5 0	45 10 0
Elementary agriculture	..	..	34 10 0	6 14 3	16 15 10	19 16 5	189 0 7	51 19 3	65 12 6	..
Dairy-work	..	..	..	..	..	..	..	..	..	..
Elementary physiology	..	..	..	..	1 12 6	..	5 1 11	2 3 6	5 5 0	0 17 0
Swimming and life-saving	..	..	85 10 0	85 11 0	2 6 8	0 11 0	10 0 0	10 8 0	..	3 5 0
Elementary physical measurements	..	..	7 10 0	..	..	..	88 15 7	18 19 2	195 0 0	5 7 5
Elementary science	..	..	..	..	20 10 3	13 8 9	0 16 2	2 18 0	..	..
	29 12 4	50 0 6	1,308 4 7	1,114 17 6	764 18 5	635 10 5	1,380 2 3	1,115 19 10	1,287 2 4	822 10 0

SUMMARY.

Education Districts.	Receipts.	Expenditure.	Education Districts.	Receipts.	Expenditure.
	£ s. d.	£ s. d.		£ s. d.	£ s. d.
Auckland	3,187 15 1	3,941 3 2	Westland	29 12 4	50 0 6
Taranaki	445 1 11	432 2 8	North Canterbury	1,308 4 7	1,114 17 6
Wanganui	1,359 16 5	1,492 17 5	South Canterbury	764 18 5	635 10 5
Wellington	1,660 4 5	1,963 12 2	Otago	1,380 2 3	1,115 19 10
Hawke's Bay	1,097 11 5	1,179 3 0	Southland	1,287 2 4	822 10 0
Marlborough	172 3 1	179 12 3			
Nelson	604 2 10	588 16 9	Totals	13,308 2 1	13,544 12 0
Grey	11 7 0	28 6 4			

TABLE D.—JUNIOR AND SENIOR FREE PLACES AT TECHNICAL SCHOOLS OR CLASSES, 1906.

["J" represents Junior; "S" Senior.]

School or Classes.	Subjects and Number of Pupils.																			
	Commercial Work.		Iron and Woodwork, Painters' Work, &c.		Electrical Engineering, Machine-drawing, &c.		Art, Pure and Applied.		Applied Mathematics and Applied Drawing.		Domestic Economy.		Plumbing.		Other Subjects.		Totals.		Capitation for Year ending 31st December, 1906.
	J.	S.	J.	S.	J.	S.	J.	S.	J.	S.	J.	S.	J.	S.	J.	S.	J.	S.	
Auckland Education Board—																			£ s. d.
Technical College, Auckland	182	1	44	2	72	2	13	..	..	..	69	..	18	..	..	..	398	5	595 7 9
Technical classes, Dargaville	7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7	..	13 17 6
" Whangarei	12	..	5	..	..	..	4	..	..	..	..	..	..	..	1	..	22	..	26 13 9
" Hikurangi	8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8	..	..
" Kamo	5	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	6	..	..
" Thames	44	..	6	..	8	..	..	..	..	..	26	..	..	..	..	..	84	..	237 1 6
" Turua	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	..	..
Taranaki Education Board—																			
Technical School, New Plymouth	3	1	..	..	2	..	..	..	1	..	..	1	..	..	..	..	6	2	7 0 0
Technical classes, Stratford	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	..	4	..	..
Wanganui Education Board—																			
Technical School, Wanganui	113	..	10	..	14	..	..	..	7	..	6	..	3	..	..	..	153	..	300 17 6
" Hawera	1	..	..	..	..	..	3	..	..	..	..	..	..	..	..	..	4	..	17 10 6
" Feilding	38	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	38	..	..
Technical classes, Eltham	5	..	..	..	..	..	..	..	..	..	2	3	..	..	..	..	7	3	..
" Mangatoki	5	..	..	..	..	..	..	..	..	..	5	..	..	..	..	..	10	..	..
Palmerston North High School Board—																			
Technical School, Palmerston North	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..
Wellington Education Board—																			
Technical School, Wellington	199	..	72	..	..	..	..	..	..	..	..	..	..	..	..	..	271	..	1,369 8 10
" Petone	16	..	1	..	3	..	2	..	..	..	..	..	..	..	..	..	22	..	29 3 6
Technical classes, Carterton	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	16 19 0
Masterton Technical Classes Association	20	..	10	..	..	..	5	..	..	..	..	..	..	..	..	..	35	..	86 10 6
Hawke's Bay Education Board—																			
Technical School, Napier	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0 19 6
Marlborough Education Board—																			
Technical classes, Canvastown	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..	2 11 6
" Havelock	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	..	..
Nelson Education Board—																			
Technical classes, Nelson	10	..	7	..	..	..	5	..	..	..	2	..	..	..	..	..	24	..	13 11 0
North Canterbury Education Board—																			
Technical College, Christchurch	64	..	..	..	..	..	..	..	17	..	..	..	..	..	..	..	81	..	213 18 9
South Canterbury Education Board—																			
Technical School, Timaru	31	..	7	..	..	..	7	..	..	..	7	..	..	..	..	..	52	..	67 2 0
Otago Education Board—																			
Technical School, Dunedin	140	2	1	..	6	..	5	2	..	..	28	..	1	..	17	..	198	4	311 7 9
" Oamaru	19	..	2	..	..	..	..	..	..	..	1	..	..	..	..	..	22	..	25 19 9
Southland Education Board—																			
Technical School, Invercargill	140	..	1	..	5	..	24	..	..	..	2	..	..	..	4	..	176	..	..
Totals	1,077	4	166	2	111	2	69	2	25	..	148	4	22	..	26	..	1,644	14	3,336 0 7

TABLE E.—SUMMARY OF EXPENDITURE BY GOVERNMENT ON MANUAL AND TECHNICAL INSTRUCTION FOR THE YEAR ENDING 31ST DECEMBER, 1906.

	£	s.	d.	£	s.	d.
Capitation				25,363	1	2
Subsidy of £1 for £1 on contributions				3,225	15	11
Grants—						
Buildings, apparatus, and rent	24,905	3	11			
Class material	951	4	4			
				25,856	8	3
Training of teachers—						
Auckland Education Board	250	0	0			
Taranaki "	195	0	0			
Wanganui "	250	0	0			
Wellington "	100	0	0			
Hawke's Bay "	250	0	0			
Marlborough "	125	0	0			
Nelson "	125	0	0			
Grey "	25	0	0			
Westland "	75	0	0			
North Canterbury "	250	0	0			
South Canterbury "	225	0	0			
Otago "	220	0	0			
Southland "	325	0	0			
				2,415	0	0
Railway fares of instructors of training-classes				474	0	6
" students attending registered classes				173	8	11
Expenses in connection with examinations—						
Science and Art, Board of Education, South Kensington	230	2	7			
City and Guilds of London Institute	470	17	7			
				701	0	2
Inspectors—						
Salaries	737	10	0			
Travelling-expenses	162	9	0			
				899	19	0
Scholarships				3,336	0	7
Specimens of students' works for Exhibition				42	13	2
Grants on account of training-colleges				923	12	5
Sundries				5	2	2
				£63,416	2	3
Less recoveries (examination fees, £149 12s. 6d.; proceeds of sale of material used at examination, £11)				160	12	6
Total				£63,255	9	9

Table F.—Board of Education, South Kensington.—Art and Science Examinations, 1906.

["C" represents candidates; "P" passes.]

Subjects of Examination.	Auckland.		New Plymouth.		Wanganui.		Wellington.		Masterton.		Napier.		Blenheim.		Nelson.		Westport.		Greymouth.		Hokitika.		Christchurch.		Timaru.		Dunedin.		Invercargill.		Totals.	
	C.	P.	C.	P.	C.	P.	C.	P.	C.	P.	C.	P.	C.	P.	C.	P.	C.	P.	C.	P.	C.	P.	C.	P.	C.	P.	C.	P.	C.	P.	C.	P.
Art—																																
Freehand drawing	25	22	..	..	5	2	5	4	1	0	..	..	..	..	8	4	1	1	..	..	..	..	13	3	3	3	29	28	6	1	96	68
Model drawing	27	18	..	..	5	4	4	3	..	..	..	..	1	0	6	2	3	1	..	..	..	..	13	6	..	..	36	20	6	4	101	58
Geometrical drawing	9	6	..	..	4	4	1	0	..	..	..	..	1	1	..	..	..	..	..	..	..	..	2	2	3	3	7	5	..	..	27	21
Perspective drawing	2	2	..	..	4	3	..	..	..	..	..	..	1	0	..	..	1	0	..	..	..	..	..	..	..	..	4	4	..	..	12	9
Blackboard drawing	10	2	..	..	2	0	3	0	..	..	..	..	1	1	..	..	2	1	..	..	..	..	26	1	..	..	16	5	1	1	61	11
Drawing in light and shade	8	8	..	..	5	1	2	2	..	..	..	..	..	..	3	3	1	0	..	..	..	..	2	2	..	..	4	3	1	0	26	19
Memory drawing of plant-form	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	6	..	..	7	7
Drawing common objects from memory	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	0	..	..	..	..	..	..	..	..	..	..	1	0	..	..	3	0
Drawing from life	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	2	..	..	2	2
Painting from still life	..	..	..	..	2	1	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	7	6	1	0	11	8
Painting ornament	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0
Design	..	..	..	..	..	..	2	2	1	0	..	..	1	0	1	0	1	1	..	..	..	..	3	2	..	..	3	3	..	..	12	8
Anatomy	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	2	..	..	2	2
Drawing from the antique	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	2	..	..	2	2
Modelling the head from life	..	..	..	..	..	..	1	1	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1
Modelling design	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0
Architecture	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	1	0	..	..	2	0
Architectural design	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	2	..	..	2	2
Students' works	..	..	..	..	5	2	4	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	19	13	..	..	28	16
Science—																																
Practical plane and solid geometry	6	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	7	7
Machine construction and drawing	24	19	..	..	5	4	3	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	13	8	..	..	45	34
Building construction and drawing	10	9	..	..	1	0	9	8	2	0	1	0	..	..	..	..	..	..	..	..	..	..	..	..	1	1	11	11	..	..	35	29
Mathematics	..	..	..	..	13	13	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	2	1	1	18	17
Applied mechanics	5	3	..	..	1	0	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	4	4	..	..	11	7
Steam	3	1	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	1
Theoretical inorganic chemistry	..	..	..	..	4	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	3
Magnetism and electricity	4	4	..	..	5	2	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	1	1	1	1	12	8
Sound, light, and heat	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0
Sound	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	1	1
Light	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	1	1
Heat	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	1	1
Botany	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	1	1
Physiography	..	..	..	..	1	1	2	0	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	4	2
Hygiene	..	..	..	..	2	2	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	4	4
Human physiology	..	..	1	1	1	0	4	2	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	1	1	..	..	8	5
Zoology	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	1	1
General biology	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	1	1
Agricultural science and rural economy	..	..	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1
Totals	133	100	3	2	68	43	44	28	6	0	1	0	6	3	20	9	12	6	1	0	1	1	63	19	7	7	177	132	17	8	559	358

TABLE G.—CITY AND GUILDS OF LONDON INSTITUTE.—TECHNOLOGICAL EXAMINATIONS, 1906.

["C" represents candidates; "P" passes.]

Subjects of Examination.	Auckland.		Whangarei.		Thames.		Waihi.		New Plymouth.		Stratford.		Wanganui.		Wellington.		Masterton.		Napier.		Nelson.		Hokitika.		Christchurch.		Timaru.		Dunedin.		Invercargill.		Totals.	
	C.	P.	C.	P.	C.	P.	C.	P.	C.	P.	C.	P.	C.	P.	C.	P.	C.	P.	C.	P.	C.	P.	C.	P.	C.	P.	C	P.	C.	P.	C.	P.	C.	P.
Plumbers' work (preliminary) ..	7	5	..	..	..	..	..	..	3	0	..	..	3	2	..	..	1	1	..	..	1	0	..	..	..	..	..	..	..	..	..	..	15	8
Principles of plumbing (ordinary) ..	2	2	..	..	..	..	..	..	..	..	..	..	5	3	3	2	..	..	4	2	1	0	..	..	..	..	2	1	..	..	..	..	17	10
" " (honours) ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	..	..	..	..	..	..	..	..	..	..	..	..	2	1
Plumbers' work, practical (ordinary)	2	0	..	..	..	..	..	..	..	..	..	..	5	1	3	1	..	..	2	0	1	1	..	..	..	..	2	1	..	..	..	..	15	4
" (honours) ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	..	..	..	..	..	..	..	..	..	..	..	..	2	1
Plumbers' work (ordinary) ..	8	7	..	..	..	..	..	..	4	0	..	..	4	3	5	5	2	2	3	3	..	..	..	..	..	..	3	0	..	..	..	..	29	20
" (honours) ..	4	4	..	..	..	..	..	..	3	3	..	..	1	1	1	1	1	0	2	0	..	..	..	..	..	..	..	..	..	..	..	..	12	9
Carpentry and joinery (preliminary)	8	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8	5
" " (ordinary) ..	7	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	8	5
" " (honours) ..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1
Cabinet-making (ordinary) ..	1	1	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	2
Mechanical engineering (ordinary), Part I	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	1	1
Mechanical engineering (ordinary), Part II	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	2	1	..	..	3	1
Electric light and power (preliminary)	4	4	..	..	3	3	..	..	..	..	..	..	1	1	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	9
" " (ordinary) ..	..	..	..	..	..	..	1	0	..	..	..	..	1	0	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	1
Wiremen's work	..	..	..	..	..	..	..	..	..	..	..	..	1	0	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	1
Electric light and power (honours) ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Telegraphy and telephony (ordinary)	..	..	..	..	..	..	..	..	..	..	..	..	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	3	2
Telegraphy (honours)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	1	1
Gas-manufacture (ordinary) ..	2	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	2
" (honours ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1
Woodwork, first year	9	6	11	5	4	3	..	..	..	..	3	3	5	3	..	..	..	..	..	..	..	..	..	..	1	1	2	1	..	..	..	..	35	22
" final	6	4	..	..	..	..	..	..	..	..	1	1	2	1	..	..	..	..	1	0	..	..	1	1	..	..	3	0	..	..	1	0	15	7
Plain cookery	31	27	..	..	..	..	..	..	..	..	..	..	3	3	..	..	..	..	..	..	2	2	..	..	5	4	..	..	4	2	..	..	45	38
Dressmaking	..	..	..	..	..	..	..	..	2	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	2
Plain needlework	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0
Totals	92	72	11	5	7	6	1	0	13	5	4	4	34	20	19	13	4	3	17	8	5	3	1	1	6	5	12	3	9	6	1	0	236	154

No. 3.

REPORT OF THE INSPECTORS OF TECHNICAL INSTRUCTION.

SIR,—

We have the honour to report as follows on the state and progress of manual and technical instruction in the colony during the year ending the 31st December, 1906.

A. MANUAL INSTRUCTION.

Manual instruction in one form or another now finds a place in the curriculum of a large number of primary and secondary schools. During the year approved classes were held in connection with nearly a thousand schools, as against 850 schools in 1905. The total number of classes for all subjects was 3,839, an increase of about 800. Details of the number of classes in the several education districts and of the subjects of instruction are given in Table B on page 6. It is gratifying to note that instruction in the various branches of elementary handwork is being co-ordinated more and more with instruction in other subjects of elementary education. Time and experience have shown that some forms of handwork lend themselves more readily to co-ordination than others, with the result that an examination of the time-tables shows that attention is being directed, in the main, to the former to the exclusion of the latter. There are indications that the time is not far distant when instruction in certain branches of handwork will be made incidental to the general work of the standards. Plasticine, paper, cardboard, bricks, and the brush are now being largely used as aids to teaching rather than as material for use in connection with set courses in handwork. As evidencing the changing attitude of many teachers with regard to the place of handwork, the following remarks may not be out of place. In paper-work, the folding of objects and the plaiting and weaving of patterns have largely given place to exercises affording opportunities for instruction in elementary geometrical notions, in arithmetic, and in measurements. In bricklaying, the bricks are now seldom used for the purpose of exercises in building alone. They are used in conjunction with drawing, and as material for exercises in oral composition and in elementary mensuration. Drawing with the brush, which not so very long ago meant the making of patterns with brush impressions on squared paper, and little else, is now regarded by many teachers as a valuable aid to drawing in outline with the pencil, affording, as it does, opportunities for direct drawing of objects in mass. The excellent display of examples of elementary and advanced brushwork at the International Exhibition in Christchurch included some creditable exercises in direct drawing with the brush from natural objects. Many of these exercises were connected with courses of instruction in nature-study. In cardboard-work, while the sole object, in certain instances, still appears to be the making of models of which no use is afterwards made, yet in an increasing number of schools in which this branch of handwork is taken up the work is not limited in its application to the extent that it was formerly. There is no doubt that cardboard-work properly treated can be made a valuable aid in teaching elementary plane and solid geometry, model-drawing, and elementary mensuration. We venture to repeat the example given in last year's report as indicating the kind of work we have in view. The form of a given geometrical solid is discussed and analysed, the pupils being encouraged to discover the best method of construction; the "net" of the model is then carefully set out in cardboard, and the construction of the model is proceeded with. A dimensioned freehand sketch of the finished model is then made, and the plan, elevation, and perhaps an isometric view and section drawn to scale. The area of each face and the total surface-area of the model are next calculated, and the relation between the faces, edges, and angles noted.

Turning now to the more specialised forms of handwork in which instruction is given in the schools, it may be said with regard to woodwork and cookery that, although a marked improvement is noticeable in certain classes both in methods of instruction and in class-work, there are still many ways in which the instruction could be made of greater educational value. In the majority of cases there appears to be little or no attempt to co-ordinate the instruction with the instruction in other subjects of the school course. This defect is probably largely due to the fact that the instructors, for various reasons, some of which seem at present to be unavoidable, rarely come into contact with the general work of the school. As regards woodwork, the instruction generally is on sound lines, the chief defect being a tendency to underrate the importance of drawing both as an integral part of the instruction and in its relation to bench-work. In some cases the drawing and the bench-work appear to be but remotely connected, whereas no pupil, especially in the earlier stages of the course, should be allowed to work an exercise in wood or to construct a model without having first made the necessary working drawings, which should be before him and used by him when working at the bench. Greater prominence could with advantage be given to demonstration lessons on the various tools, not so much with the view of endeavouring to remove all the difficulties in connection with the use of them, but in order that pupils may be helped to use them intelligently. The course of instruction should also include suitable lessons on the growth and properties of timbers in common use in the colony, while exercises in practical arithmetic and in mensuration having a direct bearing on the bench-work would not be altogether out of place. The educational exhibits at the Christchurch Exhibition included many excellent examples of pupils' work, illustrating the courses in woodwork carried out in several education districts.

In the majority of the cookery classes the instruction in the practice of cookery is being carried out on systematic lines. This, viewed from a strictly utilitarian standpoint, is well. We should, however, be glad to see more evidence of endeavours to make the instruction of greater educational value than is at present the case, by the introduction into the course of instruction of carefully graded lessons as distinguished from demonstrations on the theory that underlies the practice of the culinary art. Such lessons should include suitable experimental work carried out by the pupils themselves. The course might also well include exercises in practical arithmetic having a direct bearing on the work of the class. It is true that a course that included work of the kind indicated would probably mean a reduction in the number of recipes taught to the children; whether the education of the children would suffer thereby need not be discussed here. The fact remains, however, that instruction in cookery on the lines at present generally in vogue not only in New Zealand but elsewhere is not made as educative as it might be. The causes are not far to seek. One of the most potent has been, we think, the general absence, until quite recently, of facilities for persons undergoing a course of training with the view of qualifying as instructors in cookery to acquire the necessary scientific knowledge without which it would be idle to attempt to carry out experimental work of any value in connection with a course of cookery. It is to be hoped that those responsible for the establishment and conduct of classes for the training of teachers in cookery will be able to see their way to supplement instruction in the practice of cookery by special courses in, say, elementary physics, chemistry, physiology, and hygiene, with the view of removing as far as possible the disabilities that at present exist.

The number of classes for elementary physical measurements increased during the year from sixteen to fifty-nine. This branch of handwork can, if properly treated, be made to serve a very useful purpose as a factor in the all-round education of the child. The subject is one that can be efficiently taught in the ordinary class-room, and that does not call for anything in the way of elaborate equipment or apparatus. It thus affords an excellent opportunity for enabling pupils attending primary schools (in most of which, unfortunately, but unavoidably, there is no provision in the way of laboratories) to gain some knowledge of elementary science at first hand. The subject is admittedly not an easy one to teach, entailing as it does a considerable amount of preparation on the part of the teacher; but we are confident that the results will be found to justify fully time and labour so spent. Speaking generally, good results have been achieved in connection with most of the classes for this subject. It seems necessary, however, to remind teachers that the educational value of the work to the pupils is very often in inverse proportion to the ground covered by them during the year. A few exercises and experiments thoroughly and carefully done will have far better results than a more ambitious course treated, perforce, in a hurried and incomplete manner. The too common mistake of attempting to cover too much ground in the time available for the work is probably due to some extent to the fact that certain of the text-books dealing with physical measurements err in precisely the same direction.

There has been a very considerable increase in the number of classes for instruction in elementary agriculture. Some 250 classes were in operation during the year, as against about a hundred during 1905. Very satisfactory progress is being made in several education districts in connection with arrangements for instruction in primary schools in subjects having a direct bearing on rural occupations. Several controlling authorities have now appointed special instructors, whose duties include, in addition to the training of teachers, the supervision and direction of the pupils' work in nature-study and in connection with school gardens. It is not possible at this stage to form anything like an accurate estimate of the value of the work in the school garden, but it may be said that if in any of the classes for teachers or in any of the classes of our rural schools an interest in "the things around us" has been created—if both teachers and pupils have in any degree learnt to see the things they look at and handle in the classes, and are able to draw true conclusions therefrom—if eye and mind have been trained to see and comprehend some of the facts of life, nothing but good can result from the work not only as regards the individual, but also as regards the general work and the life of the school. In an appendix to this report will be found some extracts from programmes of work drawn up by the special instructors in agriculture in the Auckland, Wellington, and North Canterbury districts, which it is hoped may prove of some assistance to teachers in country schools.

Instruction in dairying has been again confined to one district—namely, Taranaki. There are, however, indications that arrangements will be made during the present year by the Wanganui Education Board for carrying out a fairly comprehensive scheme of instruction in this important subject in connection with the Board's schools. A special instructor has been appointed to organize and supervise the work. The scheme proposed also provides for training classes for teachers, while the establishment of classes, as opportunities offer, for persons engaged in the dairying industry will also be kept in view.

The development of the schemes now being put forward by controlling authorities in several education districts having for their object instruction in subjects having a direct bearing on rural life and industries will be watched with much interest. To commence with the primary schools is, we think, right in principle. Persons who while at school have been familiarised with some at least of the facts of their surroundings should be induced more readily to take up courses of instruction in connection with technical schools and classes than those who have not. The problem of how best to provide later on for more advanced instruction in agricultural science and rural economy for those who are now receiving primary education is now engaging the attention of certain controlling authorities. In this connection we venture to express the opinion that the usefulness of the rural district high schools would be in no way impaired if the curricula thereof were more in keeping with the industries of the districts in which the schools are located.

Speaking generally, the progress of manual instruction, including in that term all the subjects to which reference has been made above, may be described as satisfactory. Handwork is slowly but surely finding its proper place in the system of elementary education. Coincident wth a general improvement in methods of instruction is the recognition by an increasing number of teachers of the possibilities of certain forms of handwork—namely, those already referred to as now receiving most attention in the schools—in their relation to other subjects of the public-school syllabus.

B. Technical Instruction.

Details of the work of the various technical and art schools and classes for the year 1906 will be found in the reports of the controlling authorities thereof attached to this report. The number of approved classes for instruction in technological, science, art, and commercial subjects, and in subjects of general education, and the average attendance at each, are given in Table A on pages 3, 4, and 5.

There are now over thirty schools equipped in a more or less complete manner in which technical instruction is being carried on under the regulations for manual and technical instruction. In addition, technical and continuation classes were held at about fifty places in such buildings as were available for the purpose. In not a few cases these country classes are extensions of those held in connection with the technical schools in the larger centres, and are conducted on similar lines, many of them by instructors on the staffs of the parent schools or by itinerant instructors. Each year sees an extension of this system, which is to be commended for many reasons.

As has been the case in recent years, there has been during 1906 a very considerable and general demand for facilities in the way of special buildings for technical instruction. A review of the year's operations shows that a good deal has been accomplished, especially in country districts, in the direction of providing accommodation for classes. During the year grants have been made to controlling authorities for the erection of buildings or for additions to existing buildings at New Plymouth, Wanganui, Marton, Eltham, Levin, Dannevirke, Waipawa, Napier, Hastings, Wakefield, and Christchurch.

The contribution of £10,000 recently made by the Auckland Savings-bank in aid of the funds of the Auckland Technical College should, with the Government subsidy thereon, enable the Auckland Education Board, which is the controlling authority of the classes at the College, to provide much-needed permanent accommodation therefor. In this connection it may be mentioned that there was during the year a very satisfactory increase in the voluntary contributions in aid of technical education, the amount paid by the Government in the way of pound-for-pound subsidies to controlling authorities being £3,225, or nearly two and a half times as much as in 1905. This implies an increase in the local interest taken in technical education, and is to be regarded as a very hopeful sign. Controlling authorities have also been enabled by means of Government grants to provide or to make necessary additions to equipment and apparatus for classes. A good deal, however, yet remains to be done in this direction before the schools in the larger centres, at all events, can be said to be fully equipped for the important work for which they are designed. At the same time, it will probably be generally agreed that the position to-day is not altogether unsatisfactory. Progress must, if mistakes are to be avoided, necessarily be gradual. As was pointed out in last year's report, the erection and equipment at considerable cost of buildings for technical classes will not of itself call an effective system of technical education into being: earnest students must be forthcoming, and the hands of those in charge of our schools must be strengthened by the help and sympathy of local bodies, employers of labour, and others, if the system, now in its infancy, is to take and keep its proper place in the scheme of education in New Zealand.

The number of approved classes working under the regulations for manual and technical instruction during the year was 1,173, an increase of 269. This increase may be said to be due on the one hand to increased facilities for technical education, and on the other to the provision that now exists for free instruction in connection with technical classes. Classes were held at nearly eighty different places, while over 1,600 persons held free places at technical schools. The difficulty referred to in previous reports of inducing students to take up definite courses of work still exists, but to a less extent than formerly, owing largely to the continued efforts of those in charge of our technical schools and classes, who are, it may be pointed out, receiving a good deal of assistance in this matter in certain of the larger centres by reason of the improved attitude of an increasing number of employers towards technical education. The regulations governing free places have probably been of some assistance also, for the reason that persons who avail themselves of these regulations are obliged to enter on a definite course of instruction.

Many of the schools now provide fairly complete courses having a direct bearing on many of the more important arts, trades, and industries. We regret, however, to report that the facilities offered are not being in many cases sufficiently taken advantage of by those who would most benefit by them. The causes of this, or some of them, were referred to at some length in last year's report, and need not be again discussed here. It may perhaps be some consolation to know that these and other problems connected with technical education are still far from being completely solved in countries older than our own.

Most classes for technical instruction are for obvious reasons held in the evening. In certain centres, however, day classes are now in operation in addition to evening classes. These day classes are composed in most instances of holders of free places. The courses of instruction taken up by the latter are set forth in Table D on page 8. A glance at the table shows that a course of commercial instruction appears to satisfy the requirements of a very large number of free pupils —about 65 per cent. as a matter of fact. Apart from other considerations, this can hardly be regarded as entirely satisfactory from the point of view of the intention of the regulations governing free places. These regulations were certainly not framed with a view to the establishment of what are to all intents and purposes day commercial schools as distinguished from day technical schools. No doubt commercial instruction should be provided for in any scheme of technical education having pretensions to completeness: whether it is desirable that in a colony like New Zealand it should occupy the position that it at present appears to do is another matter. It is to be sincerely hoped that the returns for the current year will give evidence of a more equable state of affairs than the table already referred to indicates. The causes for the general demand that appears to exist both in town and country for some form or other of commercial instruction are not far to seek. It is not proposed, however, to discuss them here. Some of them, which perhaps time alone will remove, were referred to in last year's report. For others, and not the least potent ones, it may perhaps be possible to find a remedy. Another and more gratifying fact shown by the table is the comparatively large number of free pupils taking up courses in wood and metal work and in mechanical and electrical engineering. Excellent work has been done in many instances in connection with these subjects. The educational exhibits at the International Exhibition in Christchurch included some meritorious work by free pupils attending the Wellington Technical School. We would mention in particular exercises in carpentry and joinery and in electrical-instrument making.

Reviewing the general work of the technical schools as a whole, we are glad to not the steady increase in the number of students in attendance at classes for mechanical and electrical engineering and for plumbing, carpentry and joinery, and cabinetmaking. In this connection it is worthy of mention that very interesting and instructive collections of students' work in the subjects mentioned, mainly in connection with classes at the Auckland Technical College and the Wellington Technical School, were displayed at the International Exhibition. The exhibits referred to were very favourably commented on by those competent to form an opinion.

It would appear that an increasing number of our young mechanics are beginning to realise the personal benefit to be derived from a systematic study of the principles underlying the crafts in which they are engaged. Increased facilities have been provided in the larger technical schools for workshop practice affording opportunities for a class of work demanding high manipulative skill and the exercise of considerable mental effort. The work of many of the classes for plumbing is of a very high order, and the successes of students at the local examinations and at those of the City and Guilds of London Institute may safely be taken as indicating that the provision made for instruction in plumbing will bear comparison with that made elsewhere.

The art classes in connection with the various technical schools continue to do good work. As mentioned last year, applied art is receiving more attention than heretofore. There has been a considerable increase in the number of and in the attendance at classes for design, modelling, wood-carving, and repoussé work. There are indications of a further extension of this work in the direction of classes for enamelling and jewellery work in connection with at least two schools. The specimens of the work of art students exhibited at the Christchurch Exhibition provided a very interesting and instructive display. We would mention in particular the work of students of the "Elam" School of Art, the Wellington Technical School, and the Canterbury College School of Art.

We are unable to report much progress in the matter of instruction, in connection with technical classes other than training classes for teachers, in subjects relating to agriculture and other rural occupations. As we stated last year, it will probably be some time before such classes can be successfully established on anything like systematic lines. In several districts the necessary preliminary steps are being taken to prepare pupils attending public schools for more advanced and specialised instruction later on. The attempts that have been and are being made to inaugurate courses of instruction for persons engaged in rural pursuits have not, we are afraid, met with the encouragement that they deserve at the hands of those who should be the first to recognise the benefits to be derived therefrom. This is quite in accordance with the experience of educational authorities in other countries in connection with similar attempts. There are, however, not wanting signs of the awakening of a healthy public opinion in favour of such instruction, also of a desire on the part of a section of the farming community to see facilities provided for systematic instruction in agricultural science and rural economy. There can be no question as to the economic value of such instruction, and, while this aspect of the matter is not the only one to be considered, yet it is a side of technical education that ought not to be overlooked. If those directly interested in the dairy industry, for instance, are to obtain the best, and therefore the most profitable, return from their herds, it is very essential that they shall know how to test the profitableness or otherwise of each animal in the herds. Not so very long ago it was generally supposed that a cow giving an abundance of milk gave good returns to the farmer, whereas actual tests have shown in many cases that abundance of milk is quite an unimportant factor. Milk of good quality—that is, milk containing a high percentage of butter-fat—is of greater commercial value than a quantity of milk in which the percentage is low. The area of land devoted to dairying and the number of dairy herds are increasing year by year. This alone should suggest to controlling authorities in districts in which dairying is an important industry the desirability of providing courses of instruction having a direct bearing on an industry which bids fair to become one of the principal sources of the colony's revenue. If the work of rural technical schools, including in that term district high schools, be partly directed, if only in an elementary way in some instances, towards improvements in methods of production in connection with agricultural and pastoral pursuits, nothing but good would result to those immediately concerned and, incidentally, to the revenue of the colony. If, on the other hand, too great prominence be given to courses of instruction which, while good in themselves, may ultimately make the pursuits common to rural life distasteful to those who are naturally fitted to become the colony's future farmers and pastoralists, the results may be quite otherwise.

The Art and Science Examinations of the Board of Education and the Technological Examinations of the City and Guilds of London Institute were conducted as usual by the Department. The results, which are given on pages 10 and 11, may be summarised as follows: Of 559 candidates who sat for the South Kensington Examinations, 368 passed; the number of students' works sent Home for examination in connection with art certificates was 28, of which number 16 were accepted by the examiners. The number of candidates who sat for the Institute's examinations was 236, of which number 154 passed. At the Institute's examinations for teachers in cookery and woodwork, 38 teachers passed in cookery and 29 in woodwork. The examinations were held at sixteen centres.

M. H. Browne,
E. C. Isaac,
Inspectors of Technical Instruction.

The Inspector-General of Schools, Wellington.

No. 4.
MANUAL AND TECHNICAL INSTRUCTION IN THE SEVERAL EDUCATION DISTRICTS.

AUCKLAND.

EXTRACT FROM THE REPORT OF THE EDUCATION BOARD.

There has been a large extension of school classes during the year. Work has been continued at the three manual-training schools in Auckland, and also at the Thames and at Whangarei. Proposals for the establishment of similar schools at Hamilton and Cambridge are under consideration. Special attention has been given to the subject of agriculture and nature-study. Classes for the instruction of teachers have been held at various centres.

A munificent donation of £10,000 has been received from the trustees of the Auckland Savings-bank towards the fund for building a technical college for Auckland. This amount, with other donations and the Government subsidy thereon, will enable the Board to proceed with the erection of a suitable building upon the site secured from the Auckland City Council for the purpose. The building is to be designated the "Seddon Memorial Technical College."

EXTRACT FROM THE REPORT OF THE CHIEF INSPECTOR OF SCHOOLS.

Various branches of handwork are now widely taught, even in the smaller schools, and the benefits resulting therefrom are generally acknowledged. Paper-folding is not always sufficiently associated with drawing, and the exercises are seldom used as means of getting pupils to talk of and describe the forms produced. Brush drawing meets with great favour, and in the larger schools much excellent work has been done in this department. In some daubing is too noticeable. School gardens are becoming more numerous; both teachers and children are taking an increasing interest in them. It is most desirable that a serious effort should be made to provide school gardens in connection with all schools, and I would urge head teachers and School Committees to take this provision in hand without delay. In connection with nature-study and agricultural knowledge the pupils should always keep a special note-book, and drawings by the pupils should be freely entered in its pages. Besides these drawings—often rough ones—that pupils make themselves, there might sometimes be better copies of the teacher's blackboard sketches. It is pleasing to find a growing number of our younger teachers able to use blackboard drawings and sketches effectively in connection with various lessons.

EXTRACT FROM THE REPORT OF THE DIRECTOR OF TECHNICAL EDUCATION.

During the year 1906 very considerable progress was made in this district in manual training and technical education. The number of pupils attending the various classes was not only considerably in advance of that of the previous year, but, speaking generally, the quality of the work done showed steady improvement.

The initiation of a new movement, particularly in a new country, is generally accompanied by considerable opposition on the part of the public, chiefly, no doubt, on account of the natural conservatism of the people, who require to be convinced of the advantages of the movement by the results that it produces. "The proof of the pudding is undoubtedly in the eating," and it is gratifying to know that the general public now fully recognise the advantages of technical education and manual training, as initiated in this district in 1902.

Handwork in the Primary Schools.—The term "handwork" is a very comprehensive one, and is in New Zealand applied to those subjects of manual training which are taught in the standards of the primary schools, such as brush drawing, paper cutting and folding, plasticine modelling, &c. Of these subjects, in the Auckland District brush drawing has been taken up more than any other, and under the direction of the Board's Art Instructors, Messrs Harry Wallace and Francis C. J. Cockburn, the work has continued to make good progress during the past year. Handwork was taught in 195 schools, as against ninety-seven schools in 1906. An exhibit of brush drawing from various Auckland schools was sent to the Christchurch Exhibition, where it was very favourably commented upon.

Cookery and Woodwork Classes in connection with Primary Schools.—Instruction in cookery and woodwork to girls and boys respectively, in Standards V and VI of the primary schools, was given as in the previous years at the five manual-training schools—Newton, Newmarket, Ponsonby, Thames, and Whangarei. Woodwork classes were also started by the head teachers of two country schools—viz., Mr. Charles Cooper at Bombay, and Mr. George Wilson at Mayfield. The tools and benches for these two schools were provided out of the Board's Maintenance Fund, as up to the present the Department has not seen its way to make any grant towards the equipment for teaching woodwork in small country schools. This is much to be regretted, as, apart from the educational value of woodwork, in country districts its utilitarian value is, if anything, greater than in towns, and an initial grant for woodwork, such as is given in the case of elementary agriculture, would be most useful in such schools. At the Leaving Certificate Examination held in Auckland in July, 43 candidates sat for the examination in woodwork, of whom 14 passed, whilst 8 candidates out of the 14 who entered for the cookery examination were successful. It is encouraging to know that many of the employers in the various woodworking trades will only take as apprentices boys who have attended woodwork classes at a manual-training school.

Movements set on foot in 1905, and having for their object the establishment of manual-training schools at Hamilton and Cambridge, for the teaching of cookery and woodwork in and around those centres, have resulted in a sum of £180 having been collected at Hamilton and £120 at Cambridge. It is hoped that these schools will be erected during 1907, and as the two towns are within twelve miles of each other the same staff of teachers can be utilised for both centres.

Nature-study and Elementary Agriculture.—With the arrival in Auckland in May of Mr. Vincent W. Jackson, B.A., of the Ontario Agricultural College, Guelph, steps were taken to initiate the scheme of agricultural education which had been submitted to the Board in May, 1904. In order that teachers should have an opportunity of receiving instruction from Mr. Jackson which would enable them to introduce "nature-study as applied to elementary agriculture" into their schools, it was decided that a limited number of teachers should attend at convenient centres for two days per week for a period of three months. During these two days the schools at which these teachers were engaged were to be closed. About fifty teachers attended the two Waikato centres—viz., Hamilton and Cambridge—during the months of July, August, and September. For the last three months of the year Whangarei and Hikurangi were selected as the centres of instruction. About fifty teachers attended at these centres. The teaching given at each centre was practically the same, being slightly modified according to local requirements. At the end of each course certificates were awarded to those teachers who attended regularly, made satisfactory progress, and passsed an examination on the work done during the term. The number of certificates awarded was seventy-one.

I wish here to record my appreciation of the energy and enthusiasm shown both by Mr. Jackson and by the teachers. I feel sure that the introduction into the Auckland schools of "nature-teaching" in its present form will prove of inestimable value to the community. In this colony, where the cultivation of the land is the most important industry, it is essential that a large percentage of the population should possess a liking for rural pursuits. "Habit is second nature," and if the habit of studying Nature's ways is formed in the primary schools there is no doubt that an increasing number of individuals will be attracted to country life. With the introduction of systematic instruction for teachers in elementary agriculture has come a corresponding increase in the number of schools in which elementary agriculture is taught. The subject was taught in fifty-four schools, as against six in 1905.

During the present year it is hoped that an agricultural school will be established at Hamilton for boys and girls who have passed through the primary schools, at which they can receive instruction which will especially fit them for country life, whilst at the same time their general education will not be neglected.

The Training of Teachers in Art, Cookery, and Woodwork.—Cookery and woodwork classes for teachers were held in connection with the local manual-training schools at Auckland, Whangarei, and Thames. At the examinations of the City and Guilds of London Institute in these subjects twenty-seven teachers passed the examination in cookery and eighteen in woodwork. Art classes for teachers were conducted in the evenings and on Saturday mornings at the Auckland Technical College by Mr. Harry Wallace, and it is satisfactory to note that, although this was the third year in which teachers' art classes had been held, the numbers attending were larger than ever. The subjects taken up included freehand, model, blackboard and brush drawing, drawing of plant-form, and light and shade.

During the year art classes for teachers were also held at Hamilton, Cambridge, Whangarei, Hikurangi, Aratapu, and Dargaville under the direction of Mr. F. C. J. Cockburn. Whilst excellent work was done in many of these classes, in the winter months, owing to the bad roads and the distances which many of the teachers had to ride, the attendance was very irregular. It would appear from past experience that the only way of giving teachers in remote country districts special instruction, which will help them to teach art, nature-study, &c., in their schools, is to hold summer classes in Auckland or in some other large centre of population during the holidays, as in many cases they are so far removed from centres of population that it is impossible for them to attend classes at such centres even on Saturday mornings.

Technical and Continuation Classes in Country Districts.

During the year technical and continuation classes were held at Thames, Whangarei, Dargaville, Onehunga, Te Kopuru, Hikurangi, Whakapara, Kamo, Turua, Hamilton, Paeroa, Te Aroha, Waihi, and Waihou.

Thames.—The subjects taught at Thames included English, commercial arithmetic, typewriting, shorthand, book-keeping, dressmaking, cookery, French, practical mathematics, machine construction and drawing, geometrical drawing, and carpentry and joinery. The number of individual students in attendance was 158, and the number of class entries 560. The attendance at many of the classes was somewhat irregular, and comparatively few students presented themselves for examination at the end of the year, the results showing 66 passes and 36 failures. It is to be regretted also that so few students qualified for senior free places. Of the 74 who joined the classes in 1905, 6 only qualified at the end of 1906 for senior free places. The local Superintendent, Mr. W. H. P. Marsden, was as energetic as ever in doing all in his power to make the classes a success.

Te Kopuru.—For half the year a dressmaking class was held at Te Kopuru, at which 14 students attended.

Whakapara.—Continuation classes were held in English and commercial arithmetic, and were attended by 8 students.

Whangarei.—Technical classes in shorthand, book-keeping, commercial arithmetic, commercial correspondence, English, French, German, building-construction, trade drawing, practical mathematics, carpentry and joinery, dressmaking, botany, physiology, and drawing and painting from nature were held at Whangarei during the session. The number of individual students in attendance was 127, and the number of class entries 254. There were 23 entries only for the examinations of the Technical College held at the end of the year, as a result of which 17 certificates were awarded. Of the 41 pupils who obtained free places in 1905, 4 only qualified for senior free places at the end of 1906.

Dargaville.—The classes held at Dargaville last year were English, commercial arithmetic, typewriting, book-keeping, dressmaking, and painting from nature. Of these the dressmaking classes were the only ones that were well attended. None of the free-place pupils of 1905 qualified for senior free places.

Kamo.—Technical classes were held at Kamo for the first time, the subjects taken up being English, commercial arithmetic, German, shorthand, and book-keeping. The number of individual students in attendance was 20, and the number of class entries 61.

Onehunga.—The only technical class held at Onehunga in 1906 was in dressmaking, at which 13 students attended.

Hikurangi.—A start was made with technical classes at Hikurangi, the subjects taken up being English, commercial arithmetic, commercial correspondence, book-keeping, and dressmaking. The number of individuals in attendance was 30, and the number of class entries 73.

Turua.—Technical classes were commenced in Turua in the following subjects: Commercial arithmetic, commercial geography, English, book-keeping, history, drawing, and mathematics. The number of individual students was 14, and the number of class entries 59.

Waikato Dressmaking Classes.—At the beginning of the year the Board appointed as an itinerant instructor in dressmaking Miss Bessie Campbell, who had been assistant instructor in dressmaking at the Technical College during 1905.

Miss Campbell visited in turn during each week Hamilton, Paeroa, Te Aroha, Waihi, and Waihou. The classes were attended by about eighty students. Considering the population of these places the attendance was very satisfactory, and some excellent work was done.

Speaking generally, the country evening classes in this district have been disappointing. There seems a great tendency to view the classes, when they are started, in the light of an entertainment; a proportionately large number of pupils join, but when they find that knowledge is only gained by assiduous application and individual effort a large number of them leave the classes. Then, again, many of the country students are not willing to attend such classes as will so improve their general education as to enable them to derive benefit from attendance at specialised classes.

Auckland Technical College.

Day Classes.—During the year a very important step was taken in inaugurating day classes for boys and girls who had passed through the public schools, and who had obtained the necessary qualification to enable them to enter technical classes as free pupils. During the past few years there has been an increased tendency all over the world to make education more practical, and of such a character as to better fit pupils for the struggle for existence once they are started in life. The following extract from the report of the Commission of the State of Massachusetts on Industrial and Technical Education, 1906, is, I think, worth quoting:—

"For the great majority of children who leave school to enter employments at the age of fourteen or fifteen, the first three or four years are practically waste years so far as the actual productive value of the child is concerned, and so far as increasing his industrial or productive efficiency. The employments upon which they enter demand so little intelligence and so little manual skill that they are not educative in any sense. For these children, many of whom now leave school from their own choice at the completion of the seventh grade, further school training of a practical character would be attractive, and would be a possibility if it prepared for the industries. Hence any scheme of education which is to increase the child's productive efficiency must consider the child of fourteen.

"Children who continue in school until sixteen or eighteen, especially if they complete a high-school course, are able to enter upon employments of a higher grade, usually in mercantile pursuits, and they are able, by reason of greater maturity and better mental training, to learn the technique of their employment in a shorter time; but they are wholly lacking in manual skill, and in what we have called industrial intelligence. For the purpose of training for efficiency in productive employments the added years which they spend in school are to a considerable extent lost years. In the cases of both classes of children the employment upon which they enter on leaving school is determined by chance.

"The productive industries of the State, including agriculture, manufactures, and building, depend mainly upon chance for recruiting their service. A few apprenticeships still exist in a few industries or parts of industries, but very few apprentices are indentured, and many so-called apprenticeships are falsely named. The knowledge and skill which the new men bring to the service of any industry is only what they have picked up in a haphazard way. Some bring much and many bring little. This condition tends to increase the cost of production, to limit the output in quantity, and to lower the grade in quality. Industries so recruited cannot long compete with similar industries recruited from men who have been technically trained. In the long-run that industry, wherever in the world it is located, which combines with general intelligence the broadest technical knowledge and the highest technical skill, will command the markets of the world.

"The industries of Massachusetts need, in addition to the general intelligence furnished by the public-school system and the skill gained in the narrow fields of subdivided labour, a broader training in the principles of the trades and a finer culture in taste as applied to material, workmanship, and design. Whatever may be the cost of such training, the failure to furnish it would in the end be more costly.

"The State needs a wider diffusion of industrial intelligence as a foundation for the highest technical success, and this can only be acquired in connection with the general system of education into which it should enter as an integral part from the beginning. The latest philosophy of education reinforces the demands of productive industry by showing that that which fits a child best for his place in the world as a producer tends to his own highest development physically, intellectually, and morally.

"The investigation has shown the increasing necessity for a woman to enter the industrial world for the sake of self-support, and hence that she should be prepared to earn a respectable living-wage, and at the same time that the attempt should be made to fit her so that she can and will enter those industries which are most closely allied to the home.

"The investigation has shown that that vocation in which all other vocations have their root—namely, the care of the home—has been overlooked in the modern system of education. In order that the industrial life of the community may be vigorous and progressive, the housekeepers need to be instructed in the laws of sanitation, in the purchase, preparation, and care of food, and in the care of children, that the home may be home, and not merely a house."

The day-school, which might be termed a "preparatory trade school," commenced with 83 pupils, of which 38 took up the science and technological course, and 45 the commercial. The former course was designed to provide a sound practical education for boys, which at the end of two years should fit them either (*a*) to enter practical life as apprentices in engineering, carpentry and joinery, cabinetmaking, &c., and to continue their studies at the evening classes of the Technical College, or (*b*) to take up a specialised technical course in the College Senior Day Classes.

The commercial course, which was attended by 13 boys and 32 girls, was intended to provide a preliminary commercial training for boys and girls who had just completed their primary-school education, such as would fit them at the end of two years to either (*a*) enter business, or (*b*) to take up an advanced commercial course at the College.

During the year the majority of the pupils made good progress, and it is very gratifying to be able to record the fact that a large percentage of the parents, either by letter or personally, expressed their appreciation of the progress which their children had made during the year.

Evening Classes.—As in previous years, a number of our students sat for the examinations of the London Board of Education and of the City and Guilds of London Institute. In spite of the fact that these examinations were held at a most inconvenient time (in the middle of the session), very satisfactory results were obtained. The success of the plumbing students was again conspicuous, four successes in honours being recorded. In the Carpentry and Joinery Examination a First-class Honours Certificate was obtained for the first time by an Auckland student. This is very gratifying in view of the fact that the scope of the examination is a very wide one, and embraces a knowledge of the timbers of the world.

The continuation classes, which were held to enable students who had not previously obtained a Standard VI certificate of proficiency in a public school to improve their education and thus obtain this qualification, were attended by 70 pupils. At the end of the year 6 were awarded certificates of proficiency and 3 certificates of competency.

As a whole, the work done in the evening classes was superior to that of any previous year. The attendance was more regular, the earnestness of the students greater, and the majority of those who entered the classes for the first time were better prepared to profit by the instruction given.

As in previous years, the commercial classes were the most largely attended. This can readily be understood when the fact is taken into consideration that Auckland is a distributing centre for a quarter of a million of people. This must of necessity mean the employment of a large number of clerks.

It is disappointing to find that comparatively few ladies take up cookery, seeing the importance of this subject to the community, and the difficulty that is experienced in obtaining domestic help.

The number of individual students enrolled last year was 911, as compared with 791 in the previous year.

There is at last a fair prospect of an up-to-date College being shortly erected in Auckland. With the donations from the Auckland Savings-bank, the citizens, and the students, the Government subsidy thereon, and the Government grant of £4,000, a sum of practically £30,000 is now available. The plans have been approved by the Department, and before many months the erection of the building should be well begun.

For the past four sessions technical classes have been carried on in Auckland in sheds and other temporary buildings quite unfitted for the purpose. These buildings have been scattered over different parts of the town, and the work of organization in connection with the large number of students (nearly a thousand) has been rendered much more difficult. With the completion of the new Technical College the quality of the work will, I am sure, still further improve, and the benefits which will accrue to the community will in consequence be greater.

I trust, too, that the time is not far distant when technical schools and colleges in New Zealand will receive from the Arbitration Court the measure of recognition which is due to them, and that apprentices will be allowed by their employers to attend day technical classes.

In conclusion, I wish to thank the Board and my colleagues for the help which has at all times been so generously accorded me.

GEORGE GEORGE, F.I.C., F.C.S., Director.

Statement of Receipts and Expenditure for the Year ending 31st December, 1906, in respect of Special Classes conducted at the Auckland Technical College.

Receipts.	£ s. d.	*Expenditure.*	£ s. d.
Capitation on special classes	1,501 9 11	Dr. balance at beginning of year	1,498 9 0
Rent	104 0 0	Salaries of instructors	1,848 9 2
Furniture, fittings, apparatus	6 15 6	Office expenses (including salaries, stationery, &c.)	329 11 5
Subsidies on voluntary contributions	83 9 0	Advertising and printing	111 13 4
Material	88 7 0	Lighting and heating	84 8 8
Fees	565 17 9	Insurance and repairs	3 2 9
Voluntary contributions	6 12 0	Rent	111 7 3
Sales of apparatus	20 0 0	Material for class use	478 14 10
Rent of school-site	16 10 0	Survey of site for college and legal expenses	11 10 0
Donations towards new Technical College	10,472 0 0	Incidental expenses	84 10 10
Sales of material	84 13 0	Furniture, fittings, apparatus	387 10 7
Entrance fees, students, &c.	7 18 0	Balance at end of year	8,008 4 4
	£12,957 12 2		£12,957 12 2

VINCENT RICE,
Secretary to controlling authority.

Statement of Receipts and Expenditure for the Year ending 31st December, 1906, in respect of Technical and Continuation Classes in Country Districts.

Receipts.

Centre.	Balance at Beginning of Year. £ s. d.	Grants from Government: Capitation on Special Classes. £ s. d.	Grants from Government: Capitation on Free Places. £ s. d.	Grants from Government: Furniture, Fittings, and Apparatus. £ s. d.	Grants from Government: Material. £ s. d.	Grants from Government: Subsidies on Voluntary Contributions. £ s. d.	Other Receipts: Fees. £ s. d.	Other Receipts: Voluntary Contributions. £ s. d.	Other Receipts: Sales of Material, &c. £ s. d.	Balance at End of Year. £ s. d.	Totals. £ s. d.
Thames ..	..	594 9 11	..	19 2 0	..	45 15 0	..	31 5 0	4 0 0	..	694 11 11
Whangarei	..	258 17 11	..	39 17 1	1 2 3	14 8 0	73 13 6	4 2 0	12 5 0	..	404 5 9
Waikato ..	..	37 8 9	..	48 10 0	..	..	112 10 0	..	27 10 0	..	225 18 9
Dargaville ..	..	133 2 8	5 1 0	..	..	5 16 0	32 8 0	5 16 0	..	..	182 3 8
Hikurangi ..	..	..	..	..	..	..	2 5 0	..	..	7 4 9	9 9 9
Kamo ..	..	13 15 4	..	..	..	..	6 0 0	..	..	..	19 15 4
Onehunga ..	11 8 4	18 10 3	..	..	..	..	8 15 0	..	..	..	38 13 7
Te Kopuru	..	..	..	..	..	..	10 10 0	..	..	..	10 10 0
Turua ..	..	17 9 5	..	..	..	..	..	..	..	..	17 9 5
Totals ..	11 8 4	1,073 14 3	5 1 0	107 9 1	1 2 3	65 19 0	246 1 6	41 3 0	43 15 0	7 4 9	1,602 18 2

Expenditure.

Centre.	Balance at Beginning of Year. £ s. d.	Administration: Salaries of Instructors. £ s. d.	Administration: Office Expenses, Advertising, Lighting and Heating, &c. £ s. d.	Administration: Rent. £ s. d.	Administration: Material. £ s. d.	Administration: Incidental Expenses. £ s. d.	Furniture, Fittings, and Apparatus. £ s. d.	Balance at End of Year. £ s. d.	Totals. £ s. d.
Thames ..	271 1 8	150 17 6	59 18 3	..	8 8 8	16 4 8	1 10 0	186 11 2	694 11 11
Whangarei	17 9 0	133 7 8	4 18 8	..	9 8 5	4 6 6	18 13 4	216 2 2	404 5 9
Waikato ..	..	78 2 6	6 17 1	6 2 0	30 10 0	20 12 7	39 13 0	44 1 7	225 18 9
Dargaville ..	..	107 11 6	3 17 0	..	..	..	24 12 9	46 2 5	182 3 8
Hikurangi ..	..	..	..	..	..	..	9 9 9	..	9 9 9
Kamo ..	..	13 0 0	1 14 7	..	..	1 10 0	..	3 10 9	19 15 4
Onehunga ..	..	8 10 0	0 13 1	..	..	..	3 0 0	26 10 6	38 13 7
Te Kopuru	..	..	..	..	..	..	8 4 9	2 5 3	10 10 0
Turua ..	..	..	..	..	..	..	..	17 9 5	17 9 5
Totals ..	288 10 8	491 9 2	77 18 8	6 2 0	48 7 1	42 13 9	105 3 7	542 13 3	1,602 18 2

VINCENT RICE,
Secretary to Controlling Authority.

Extract from the Report of the Director of the "Elam" School of Art.

During 1906 the whole of the classes have been well attended, the day classes having had a larger proportion of the total attendance than usual. The usual classes in the departments of freehand and model drawing, geometry, perspective, light and shade, monochrome painting, design, modelling, still-life painting, drawing and painting from the antique and from life, have been held throughout the year, and the progress made has been generally quite satisfactory. Classes in modelling and wood-carving were recommenced at the beginning of the year, and have been continued most successfully throughout. A large amount of excellent work has been done, and there are now six classes each week in these subjects, and each class is attended by as many students as can be accommodated in the two rooms taken by the managers for this purpose. There is a continuous inquiry for work of this and similar classes, and I hope to be able to add to these successful classes during the coming year. I am also glad to find at last some interest taken in design for arts and crafts work, and hope to be able to give those interested every encouragement by practical classes next year.

There were about 405 students on the roll of the school during the last term, but of these a number are only able to come for short hours, or even for short periods. It is gratifying to see the interest taken by country students in their work. Many students come into town from long distances to attend our classes, some daily, others coming once a week and staying a night or two in town, while a few come over a hundred miles at intervals and spend a few weeks in town in order to get all the time they can at their work. It is a pity that the free railway passes should not be obtainable by all genuine students attending such classes without restriction as to age, &c., considering that it would not cost the Government anything, and would aid very materially in furthering education in the arts and technical subjects.

The total attendance registered for the year has been 36,325, which will be easily increased when the additional rooms kindly promised by the City Council are available.

E. W. Payton, Director.

Statement of Receipts and Expenditure for the Year ending 31st December, 1906, in respect of Associated Classes conducted at the "Elam" School of Art.

Receipts.	£ s. d.	*Expenditure.*	£ s. d.
Balance at beginning of year	170 13 4	Salaries of instructors	789 6 8
Capitation on associated classes	444 16 6	Office expenses (including salaries, stationery, &c.)	55 2 10
Furniture, fittings, apparatus	17 18 0	Advertising and printing	33 4 0
Subsidies on voluntary contributions	150 0 0	Lighting and heating	21 15 6
Fees	25 14 0	Insurance and repairs	2 16 2
From the trustees for the "Elam" School of Art	249 3 7	Material for class use	24 13 5
		Models	9 7 0
		Various	18 2 4
		Furniture, fittings, apparatus	35 16 0
		Balance at end of year	68 1 6
	£1,058 5 5		£1,058 5 5

Sam. Jackson, Chairman } of Managers.
E. W. Payton, Secretary }

TARANAKI.

Extract from the Report of the Education Board.

Elementary handwork was taken at 39 schools, and sewing, under the regulations for manual and technical instruction, in 13. In addition to the above, classes for manual instruction as defined by clauses 22–27 of the regulations were recognised in 37 cases, the subjects embracing woodwork, botany, dairying, advanced needlework, elementary agriculture, swimming and life-saving, elementary physical measurements, chemistry, and elementary physiology. Considerable progress has been made in technical education, especially in elementary agriculture. Owing to numerous applications for a cookery class at Stratford, it was found necessary to make an application to the Department for an additional room in the Technical School, and the Department promptly responded. Tenders are now being called for the work.

The New Plymouth Technical School is nearing completion, and will fill a great want in the district.

Extract from the Report of the Director of Technical Instruction.

During the year technical and continuation classes were conducted at New Plymouth, Stratford, and Opunake. The subjects in which instruction was given included plumbing, dressmaking, agriculture, electricity, botany, woodwork, wood-carving, various branches of drawing and commercial instruction, handwork (for teachers), languages, and mathematics. In all some thirty classes were held, the total average attendance being about five hundred. The attendance of the students at the several classes was fairly regular, and the punctuality was very good. The instructors, as a rule, were painstaking and zealous in the discharge of their duties, and are deserving of credit for the highly satisfactory work done.

W. A. Ballantyne, Director.

Statement of Receipts and Expenditure for the Year ending 31st December, 1906, in respect of Special Classes conducted at New Plymouth.

Receipts.	£ s. d.	*Expenditure.*	£ s. d.
Capitation on special classes	41 1 6	Balance at beginning of year	50 14 5
Capitation on account of free places	7 0 0	Salaries of instructors	130 7 0
Rent	5 2 6	Office expenses (including salaries, stationery, &c.)	14 5 0
Furniture, fittings, apparatus	65 6 9	Advertising and printing	6 16 3
Material	13 16 1	Lighting and heating	6 16 6
Fees	125 2 6	Insurance and repairs	0 5 0
Balance at end of year	21 14 7	Rent	1 17 6
		Material for class use	8 5 0
		Rebates on fees	19 7 6
		Caretaker	14 19 6
		Furniture, fittings, apparatus	25 10 3
	£279 3 11		£279 3 11

W. A. BALLANTYNE, Director.

Statement of Receipts and Expenditure for the Year ending 31st December, 1906, in respect of Special Classes conducted at Stratford.

Receipts.	£ s. d.	*Expenditure.*	£ s. d.
Balance at beginning of year	27 8 7	Salaries of instructors	89 6 6
Capitation on special classes	36 17 7	Office expenses (including salaries, stationery, &c.)	14 1 0
Furniture, fittings, apparatus	12 12 6	Advertising and printing	3 16 6
Fees	50 11 9	Lighting and heating	4 13 10
Balance at end of year	19 12 4	Insurance and repairs	3 13 6
		Caretaker	20 0 0
		Petty cash	1 15 8
		Furniture, fittings, apparatus	9 15 9
	£147 2 9		£147 2 9

W. A. BALLANTYNE, Director.

WANGANUI.

EXTRACT FROM THE REPORT OF THE EDUCATION BOARD.

The Board has taken special pains to develop the facilities offered for the extension of technical education, and the results are highly gratifying to all concerned. The success of the work carried out by Mr. Grant, agricultural instructor, is assured, and the numerous school gardens are striking testimony to the practical results of such instruction. The experimental garden at Halcombe School, from which it is proposed to draw seeds and plants for other school gardens, is in an excellent condition, reflecting high credit on Mr. Strachan, the headmaster. The Agricultural and Pastoral and Horticultural Societies have liberally aided this movement, and the competitions inaugurated by them will continue to stimulate it. The Board appointed Mr. R. Browne dairy instructor, and their thanks are due to the Agricultural Department for their courteous assistance in enabling him to pursue his bacteriological studies. After the holidays are over instruction in scientific dairying will be given systematically to school classes and to adults, and there is every prospect of this important innovation proving a complete success. At Wanganui an engineering class has been established in connection with the Technical School, a machinery-room having been built and fitted up with the latest machinery. The school classes for cookery and woodwork are being extended, and now two instructors are engaged in each branch to enable the more remote districts to be reached. The children are taking considerable interest in the work, and the results are very gratifying. Owing to the great development of technical education the Board found it necessary to inaugurate a new system of management, and to that end have divided the district into three—Northern, Middle, and Southern. Mr. Braik, Chief Inspector, is Superintendent of Technical Education; Mr. Varney, Director of the Wanganui Technical School, Supervisor of the Middle District; Mr. Amos, Director of the Feilding Technical School, Supervisor of the Southern District; and Mr. Hintz, Supervisor of the Northern District; all of whom are able and enthusiastic exponents of technical education, and are doing excellent work. The central administration is in the hands of a committee of the Board, and the local administration is carried out by committees comprising representatives of local bodies and contributors to the funds. This system has been found to work smoothly and efficiently, and seems to be better than control by a body apart from the Education Board.

EXTRACT FROM THE REPORT OF THE INSPECTORS OF SCHOOLS.

Regarding the school handwork classes Mr. Varney reports as follows: "That much progress has been made in this very important branch of education is evident from the fact that, whilst in 1905 recognised classes were conducted in eighty-nine schools, in 1906 no fewer than 120 schools earned capitation under the Manual and Technical Regulations."

Thanks to Mr. Grant's fostering care, the number of school gardens is rapidly increasing. These, apart from their being a means of mental training of the highest order, are a source of health and pure delight to the children, who long for the time when the school clock will point to the gardening-hour. In this branch of school work an immense amount of good has been done by several of the Horticultural Societies. The interest which these societies create by offering prizes for the best-kept gardens and the best garden-produce cannot fail to impress children as well with the best methods of work as with the beauty and bounty of nature.

During the year an important change in the method of distributing material was decided upon. Instead of forwarding this material through local tradesmen, as was done previously, the Board decided to stock its own supplies at the office, whence teachers will in future receive what they require. Mr. P. H. Bell, of the office staff, has been appointed clerk of the manual and technical department, and he will take charge of the distribution of all material.

In October an exhibition of manual and technical work was held at Palmerston North. The work displayed, especially the plasticine-modelling, the brushwork, and the design, was distinctly in advance of the previous exhibition. The cardboard-modelling exhibit was rather disappointing both as regards quantity and quality, but now that teachers' central training classes are being organized under Mr. E. H. Clark a decided improvement should be made. My sincere thanks are due to the local teachers, who, with Messrs. Clark, Grant, and Bell, worked together splendidly and brought the exhibition to so successful an issue.

The increase in the number of woodwork and cookery classes has necessitated the employment of second instructors, Mr. Bannister, of Wellington, and Miss Fergus, of Dunedin, having been appointed. During 1906 the average attendance at the woodwork classes was 299, and that at the cookery classes 253, exclusive of the Palmerston North High School. Both Miss Mollison and Mr. Clark, who succeeded Mr. Ritchings Grant, have been most enthusiastic in the conduct of their classes, and some excellent work has resulted.

We desire to place on record our appreciation of the work done by Miss Mollison and Messrs. Varney, Grant, and Clark, whom we have found at all times willing to co-operate with us in furthering the cause of education; and to Miss Fergus, Mr. Hintz, and Mr. Bannister, who have just joined the Board's staff of instructors, we desire to extend a cordial welcome.

Extract from the Report of the Superintendent of Technical Instruction.

For the purposes of manual and technical instruction the entire district has been divided into three parts—Central, Northern, and Southern. Each of these is under the direction of a Supervisor. Mr. Varney, Director of Manual and Technical Instruction in Public Schools, and Director of the Technical School, Wanganui, takes charge of the Central District; Mr. Amos, Director of the Technical School, Feilding, takes the Southern District; and Mr. Hintz, Director of the Hawera Technical School, takes the Northern. Acting in conjunction with, and by the advice of, these Supervisors, head teachers or accredited assistants take charge of local technical schools or classes. This method of organization has been adopted by the Board with a view to the speedy extension of the benefits of technical instruction to every part of the district. A committee, composed partly of professional and partly of business men, controls each technical school, and it is to the knowledge and experience which these gentlemen bring to bear on the problems that confront them, as well as to their devotion to the cause of technical training, that the movement has made such rapid strides in the district.

In selecting special instructors the Board has been actuated by a desire to promote the development of the chief industries of the district; hence a specialist, Mr. Grant, has been appointed to attend to agricultural training in schools, and another, Mr. Browne, to perform a similar service for dairying. There are two instructors in woodwork, Mr. Clark, principal instructor, taking the Central and Northern Districts, and Mr. Bannister, second instructor, the Southern District. In cookery there are also two instructors, Miss Mollison taking the Central and Northern Districts, and Miss Fergus the Southern. A great proportion of the boys and girls of the district will accordingly leave school impressed not merely with the value of books as a means of education, but also with the worth and dignity of manual and household occupations.

It will be seen from the reports that the instruction given at the technical schools and classes falls under four chief divisions—(1) artisan classes, (2) commercial classes, (3) domestic economy classes, and (4) professional classes. Admision to these classes is free to all pupils gaining the proficiency certificate. It would be difficult to estimate the educational value of these classes to the country. To bring the primary and technical schools into yet closer relationship is, at present, one of the opportunities, as it should be one of the privileges, of all who have the cause of education at heart.

I am glad to be able to bear testimony to the generous attitude towards technical training taken by School Committees and Town and County Councils. The manner in which not a few of these bodies have seconded the efforts of the Board is proof alike of their public spirit and of their ability to read accurately the signs of the times.

Geo. D. Braik, Superintendent.

Extract from the Report of the Director of the Wanganui Technical School.

1. Northern District.—Eltham: Owing to the energy and enthusiasm of Mr. Thomas very successful classes were held during the two terms, May to December. Difficulty was experienced in accommodating adult students in the primary school; yet, notwithstanding this, one and all worked well and creditably. English, arithmetic, book-keeping, shorthand, dressmaking, millinery, photography, magnetism, and electricity were taken. The erection of science, woodwork, and cookery rooms will supply a long-felt want in the locality. Mangatoki: Although a small township, classes in book-keeping, dressmaking, English, and arithmetic were satisfactorily conducted. Now that the Board has a dairying instructor available, dairying science should prove a popular subject in this and other dairying centres. Hawera: The results here have been somewhat disappointing, due in no small measure to the lack of a central building. A fair amount of success attended the Latin, chemistry, English, arithmetic, book-keeping, and painting classes. The wood-carving classes were held as usual. Waverley: Mr. Andrews conducted successful wood-carving classes during two terms. Kaponga: Very little success attended the classes here, an epidemic of typhoid fever at the commencement of the term adversely affecting the attendance.

II. Central District.—Wanganui: With the increased accommodation at command no difficulty has been experienced, as in previous years, in arranging the various classes. The number of individual students attending has varied during the four terms of the school year, being as follows: First term, 545; second term, 603; third term, 520; fourth term, 452. Classes have been recognised by the Department during the year divided into art, artisan, commercial, domestic, and general classes.

Art Classes: Much very good work has been done, especially in design. It is to be regretted that so many students wish to learn painting before a thorough preliminary course in freehand and model drawing has been mastered. Now that special instructors have been secured for the machine-drawing and architectural drawing classes, these branches should be increasingly useful to the mechanics and builders who take advantage of the opportunities thus afforded. Models are now to hand which will undoubtedly lead to greater success than has previously been possible.

Artisan Classes: The plumbing classes have had a very successful year, as the examination results show. Mr. F. Carlisle, under whose instruction excellent work was accomplished in the theory of plumbing, resigned in October in order to take up a Government appointment, and Mr. C. Carroll was appointed to succeed him. There is still need for more earnest application on the part of some of the students, who cannot possibly hope to succeed unless their attendance is more regular. The painters' class has done some really first-class work. The Master Painters' Union takes great interest in the class, most of the employers paying the fees of their apprentices, and encouraging them to attend the classes regularly. Both the decorating and plumbing classes suffer in attendance through country work. A carpentry class, conducted at the District High School, was fairly successful until the resignation of Mr. Grant in July. Now that the new woodwork room is ready at the school, more advantage will be taken of the practical course of instruction provided. A class for tailors was opened in June, and has undoubtedly supplied a long-felt want in the town. Ten students were enrolled, and the class is doing capital work.

Commercial Classes: These are, unfortunately, the most popular classes, almost all boys and girls, on the completion of their day-school course, desiring to prepare for situations in offices. It would be much better for themselves and the community did a greater majority of the latter pay more attention to the domestic sciences, and of the former to some form of manual instruction or to agricultural science. There is no doubt that in the majority of cases really good work has been done, but one cannot help thinking that in some instances the students would have been more profitably employed in other branches of study. It is gratifying to find that so many wish to continue their book-keeping and law studies for the purpose of qualifying for an associateship of one of the New Zealand Institutes. An examination for Pitman's certificates for shorthand was held at the end of the year, the results of which are not yet to hand.

Domestic Classes: The cookery classes have been well attended, and the instruction given cannot have failed to have been beneficial. Mrs. Martin resigned in June, and Mrs. F. Webb-Jones was appointed to fill her place. Both these ladies are to be complimented on the interest they have displayed in their work. Dressmaking and millinery classes have as usual been well attended. At the close of 1906 Miss K. Johnston resigned, and Miss Bohan was appointed her successor. Home nursing was introduced at the beginning of the year, and Nurse Pitt, of the Hospital staff, took charge of the class, into which she infused a great deal of enthusiasm. The practical physiology and the invalid cooking lessons, and those on the nursing and care of children were most useful and interesting.

General Classes: The lack of accommodation for teaching science has been greatly felt, but now that a properly equipped science room is available more attention can be devoted to individual practical work. Botany and magnetism and electricity classes have been most successfully conducted, the first under Mr. J. Grant, B.A., the Board's agriculture expert. In conjunction with the photography class many instructive outdoor lessons were given. During the year thirty-five students have taken twenty lesson courses in photography. The classes have been most successful. Classes have also been held in English, French, Maori, arithmetic, and mathematics. The wood-carving and modelling classes as usual have been well attended, and some very good work has been done. It is gratifying to find more students than usual taking design and modelling in connection with their wood-carving.

During 1906 a grant of £1,000 was made by the Department for the renovation of the science room and the erection of woodwork and engineering workshops. These were completed in September, and the Hon. G. Fowlds, Minister of Education, performed the opening ceremony. Mr. S. Steele, B.Sc. in Engineering, of Canterbury College, has been appointed to take charge of the engineering classes to be established.

Mr. E. C. Isaac, Organizing Inspector for Manual and Technical Instruction, visited the school in December, and made valuable suggestions regarding the equipment of the engineering room and the courses of study to be adopted. The school reference library now contains several hundred volumes of works on technical and commercial subjects, and will undoubtedly prove of great benefit to the students. The day classes for instruction in commercial subjects proved successful, twenty-one being enrolled. Now that the school is so well equipped for technical instruction, it is hoped that day classes on a much larger scale will be established. Much assistance is given to the school by the various local bodies, and also by townspeople who generously contribute to the general and prize funds. Our thanks are especially due to the Borough Council, which, besides granting an annual contribution of £50, has generously donated two gas-stoves, gas-rings, and gas-irons to the cookery classes, and also granted the use of water free for driving a Pelton wheel, and gas at half the current rates for cookery purposes.

Marton: Little has been done at this centre outside the training classes for teachers. Very successful dressmaking classes were conducted by Miss Johnston, of Wanganui. A grant having now been sanctioned for a Technical School, the outlook for the future is most encouraging, especially in view of the fact that local interest is very keen. Hunterville: Classes in English, arithmetic, book-keeping, and wood-carving met with a fair amount of success. Mangaweka: Not a great deal of enthusiasm was manifest in this small township, although a good start was made with the standard class. Taihape: In this growing centre there are undoubtedly signs of success for future operations, and before long it will be necessary to erect a small technical school.

A. Varney, Director.

Extract from the Report of the Director of the Feilding Technical School.

Classes were commenced on the 15th May for the following subjects: Commercial arithmetic, commercial English, shorthand, book-keeping, and dressmaking. The attendance at these classes gradually increased, and at the request of students classes were also commenced in drawing and painting, photography, Latin, and mathematics. Owing to the large number of pupils attending the wood-carving and dressmaking classes, it was necessary to hold three classes in each of these subjects.

A committee consisting of representatives of the School Committees and the headmasters of the local schools managed the classes, the controlling authority being the Wanganui Education Board. Owing to the success of the classes, the committee decided to erect a suitable building where the classes could be held. A subcommittee was appointed to collect donations and to endeavour to secure a suitable site. On inquiries being made respecting sections it was ascertained that the most suitable sites were railway reserves. The Railway Department was approached to grant the use of the property for the desired object. The assistance of the Minister of Education, the Inspector-General, and Mr. Lethbridge, member for the district, was secured, and after a somewhat lengthy delay the desired permission was granted.

At the end of the first term the attendance at classes numbered 283, as follows: Arithmetic, 54; English, 52; shorthand, 25; book-keeping, 40; wood-carving, 32; Latin, 10; mathematics, 10; dressmaking, 32; drawing and painting, 16; photography, 12. £84 5s. 5d. was received in fees, and £85 14s. 1½d. earned in capitation, whilst £200 was collected or promised in aid of the proposed building. This latter amount was collected from the general public, and all local bodies contributed varying amounts.

During the second term the following new classes were started: Repoussé, agriculture, building-construction, drawing, and elocution; whilst, owing to the attendance, it was found necessary to divide the arithmetic, shorthand, and book-keeping classes into two divisions, and to conduct an extra class for dressmaking.

Twenty-four classes were conducted during the second term, attended by 306 pupils. The fees amounted to £94, and the capitation to £101.

Arrangements were made for the conduct of classes in cookery, but as an instructress could not be obtained it was impossible to hold the class. The Education Board, however, has secured the services of an instructress for next year, and, in addition to evening classes, school classes will also be conducted in this subject. School classes will also be commenced in woodwork. The classes were visited on several occasions by Mr. Braik, the Chief Inspector, and Mr. Varney, Director of Technical Instruction, Wanganui, and the committee are much indebted to these gentlemen for their assistance and valuable suggestions respecting the classes. Mr. Isaac, Inspector of Technical Schools, also inspected the classes, and signified his approval of what was being done. Application has been made to the Education Department for a grant of £3,000 for the proposed Technical School, and if this amount is granted the committee will be in a position to erect a building suitable to the requirements of the district. Meetings have been held at various centres throughout the district—viz., Kimbolton, Rongotea, Halcombe, and Bunnythorpe—and there seems to be every prospect of classes being commenced at these places next year.

H. Amos, Director.

Extract from the Report of the Education Board's Instructor in Agriculture.

I have been engaged in visiting schools and arranging for new gardens; in teaching botany and agriculture, and in taking children for excursions; and in lecturing to teachers at one of the centres—Wanganui, Marton, or Palmerston North. The number of school gardens at the end of 1905 was 22 at the end of 1906, 46. As the time set apart for garden-work is very limited, it is important that it be used effectively. To gain that end the children should know exactly what they have to do before they enter the garden, and when they have accomplished what they set about to do they should begin recording the various operations they have just completed. The garden note-book continues to be a stumbling-block. This book should contain a short record of all the gardening operations. Its value will be increased if it contains a number of drawings representing some of the plants at different stages of their growth. This book should contain the pupil's own observations recorded in his own words. It is not expected that the pupils will make any great discoveries, but if, from this exercise, they learn the habit of accurately observing and recording, then the keeping of the school note-book will not have been in vain. There is still room for improvement in the using and the handling of the garden-tools. Rakes are too often used to break clods, with the result that the teeth and frame are bent. Forks and spades should not be used as levers to remove obstructions encountered in the course of digging. With reasonable care the tools which have been supplied should last a long time. After each day's work the tools should be cleaned before being put in the tool-shed. When time permitted I gave outdoor lessons to the children of the schools I happened to be visiting. In every instance we set out to study some definite object. The children noted what they could, and when they had exhausted their resources help was afforded. Ample opportunity was given for the making of notes and collecting specimens, When convenient an account of the excursion was written and sent to me. The exercises were then corrected, valued, and the results sent to the head teacher of the school. As far as can be judged from the sixteen excursions that have been carried out, the results are satisfactory. The children paid strict attention to the work given them, and made honest efforts to collect information and explain the various phenomena with which they were confronted. In most of the composition exercises a good account of the excursion was given.

Classes for young farmers were conducted in Wanganui, Marton, and Apiti. The subject taught in each case was elementary agriculture. The students in Marton and Apiti put a good deal of thought into their work. Possibly farmers' reading circles will be established in some of the districts, and by this means farmers will be able to read and discuss the latest phases of farm practice. During the last six months of this year sixteen public addresses were given on agricultural education. The attendance was on the whole satisfactory.

On Saturdays I have, as a rule, been engaged giving lectures to teachers. As much practical work as was possible was given in addition. The lectures consisted of an outline of plant and animal life, and the application of the principles learned to the various problems that meet the teachers. The attendance during the first and second terms was very good, but there was a considerable falling-away towards the end of the year. For next year it is intended that the Saturday science work for teachers will be made much more practical. The new science room in Wanganui is now finished. This will afford an opportunity to give teachers an insight into laboratory methods. From materials supplied the teachers will be expected to make their own observations and inductions. The work will be of an elementary nature, and with certain modifications can be introduced into the schoolrooms. At Halcombe an experiment in seed-selection is being tried. For this purpose several kinds of oats were planted. The pupils selected from the various varieties the largest and finest-looking seeds. These were planted separately at various distances apart. From this season's produce a selection will be made for next year's crop. The results of this work will be watched with interest. A similar experiment is being made with potatoes. Several varieties have been selected for this experiment. The finest-looking plot has been produced from seed that grew in the school garden last year. It was carefully looked after by the children until it was planted. The full results of these experiments will not be available till March.

The Palmerston A. and P. Association, the Feilding A. and P. Association, and the Wanganui Horticultural Society have given very handsome prizes for school garden-work. The Palmerston A. and P. Association admitted school-children free to the winter show, and also arranged with Mr. M. Murphy, F.L.S., to give to the country children a lecture on gardens. Most of the children made a very systematic examination of the school exhibits, particularly those of the winning garden. Feilding results will not be available this year. The Wanganui Horticultural Society gave prizes for the best school gardens, in addition to the prizes they gave for staged exhibits. As the Inspectors of Schools attach more importance to the method by which the results have been obtained than to the results, I would suggest that in future competitions the Committees drawing up the programmes will arrange that, in addition to the exhibit, an account of the means to produce it will also be shown. As most of the societies give prizes for penmanship, this account, which would really be a synopsis of the garden note-book, might be used as the writing test. I should like to point out that the school garden-work is of educative importance first, and of economic importance second. The garden-work is the practical science-work of the school. It is hoped that the children will learn practically how to observe, experiment, and record accurately. Science-work carelessly done is not only useless but mischievous. A garden may be beautifully kept, but if this result has been obtained by following a few set rules, the reasons for which are quite unknown to the pupils, the time will soon come when gardens will fall into disrepute. In the garden-work there must be failures and successes, but from a study of these the children will gradually learn the correct procedure for their own gardens. To the officers of the Department of Agriculture, Wellington, and the Manager of the State Experimental Station, Momohaki, for much help ungrudgingly given, I tender my best thanks. Teachers and children have taken up the work of elementary agriculture with enthusiasm. I think I am justified in predicting a successful new year's work.

J. Grant.

Statement of Receipts and Expenditure for the Year ending 31st December, 1906, in respect of Special Classes conducted at Wanganui, Palmerston North, Waverley, Hawera, Hunterville, Mangaweka, Taihape, Marton, Feilding, Mangatoki, and Eltham.

Receipts.	£ s. d.	Expenditure.	£ s. d.
Capitation on special classes	1,168 18 5	Balance at beginning of year	885 0 0
Capitation on account of free places	300 17 6	Salaries of instructors and travelling-expenses	2,588 9 2
Buildings	1,000 0 0	Office expenses (including salaries, stationery, &c.)	16 10 0
Rent	17 12 6	Advertising and printing and stationery	66 2 1
Furniture, fittings, apparatus	222 13 9	Lighting and heating	47 10 2
Material	6 19 8	Insurance and repairs	14 18 6
Subsidies on voluntary contributions	142 15 6	Rent	1 0 0
Fees	1,006 8 0	Examinations, &c.	11 0 0
Voluntary contributions	112 10 9	Material for class use	122 3 5
Material sold	22 10 4	Scholarships, £98 19s. 6d.; library and prizes, £70 2s. 8d.	169 2 2
Balance at end of year	1,587 16 6	Telephone and miscellaneous, £16 14s. 10d.; cleaning, £81 3s. 11d.	97 18 9
		Travelling-expenses, teachers attending classes	23 13 6
		Payments to committees of technical classes	20 0 0
		Buildings	1,069 16 3
		Furniture, fittings, apparatus	455 18 11
	£5,589 2 11		£5,589 2 11

W. J. Carson, Secretary.

REPORT OF THE CONTROLLING AUTHORITY OF THE PALMERSTON NORTH TECHNICAL SCHOOL.

The Technical School is managed by the Board of Governors of the High School. Mr. J. E. Vernon was appointed Director in January, 1906. Art classes were carried on by Mr. G. H. Elliott for thirty-nine weeks, with an attendance of sixty-three students. Classes were also held in English, mathematics, shorthand, typewriting, book-keeping, commercial work, wood-carving, magnetism and electricity, and plumbing. These were attended by sixty-eight students. Only one student took advantage of a free place. The classes were on the whole a success, but a building nearer the centre of the town is urgently needed, as the High School building is too remote for night-work.

C. COLERIDGE HARPER, Chairman.

Statement of Receipts and Expenditure for the Year ending 31st December, 1906, in respect of Special Classes conducted at Palmerston North.

Receipts.	£ s. d.	*Expenditure.*	£ s. d.
Capitation on special classes	38 6 6	Salaries of instructors	281 3 4
Rent	14 0 0	Advertising and printing	28 14 9
Furniture, fittings, apparatus	19 14 5	Lighting and heating	18 17 7
Material	27 15 8	Rent	7 10 0
Subsidies on voluntary contributions	67 16 0	Material and permanent apparatus	67 0 4
Fees	254 17 11	Repairs	3 10 0
Voluntary contributions	70 19 0	Balance at end of year	86 13 6
	£493 9 6		£493 9 6

WILLIAM HUNTER,
Secretary, Palmerston North High School Board.

WELLINGTON.

EXTRACT FROM THE REPORT OF THE EDUCATION BOARD.

Capitation was earned by 120 schools in 1906, compared with 110 in 1905. The subjects most widely taught were brushwork and plasticine modelling; but classes were also recognised in elementary agriculture, 42; dressmaking, 2; chemistry, 3; first aid and ambulance, 2; swimming, 2; botany, 1; physics, 3; cookery, Wellington (two), Pahiatua, and Wairarapa centres. Instruction in cookery has been carried on as in previous years at Terrace and Newtown centres, Wellington, but from the present year the work will be carried on at the new centres at the Training College and South Wellington. Masterton and Carterton in the Wairarapa have been provided with well-fitted rooms; one is in course of erection at Levin; application has been made for similar accommodation at Pahiatua and Greytown; while suitable provision for the Hutt and Petone is still under consideration. A woodwork room has been completed at the Training College, and one will shortly be erected at South Wellington, for which centres the services of a capable instructor have been engaged. From the beginning of the year the management of instruction in agriculture was placed in the hands of Mr. W. C. Davies. The Board is well satisfied that the increased attention thus given to the study of elementary agriculture will be productive of much good. Forty-two schools earned capitation, and in the larger centres, especially of the Wairarapa, much has been done by local effort to aid the Board in producing the very best results. It is hoped that the work will be extended during the present year to other centres on the Manawatu line. The thanks of the Board are due to those public bodies and to individuals who have subscribed largely for providing properly prepared areas and suitable appliances for the work. The work of the instructor has so increased that the Board decided to discontinue the joint arrangement with the Technical Education Board and to engage his whole time.

EXTRACT FROM THE REPORT OF THE INSPECTORS OF SCHOOLS.

A circular on nature-study and elementary agricultural knowledge was issued by the Board at the beginning of the year. In the latter subject, which has been placed under the supervision of Mr. W. C. Davies, considerable progress has been made, and as the work is of such importance we have asked him to make a report, which we append.

During the year 120 schools earned capitation under the Manual and Technical Regulations. The subjects which find most favour with our teachers are brush-drawing and modelling in plasticine or flexine; but nearly all the subjects for which grants are given under clauses 19, 20, and 21 of the regulations are represented, and in addition grants have been earned for elementary agriculture, elementary physics, elementary chemistry, elementary physical measurements, elementary botany, swimming and life-saving, physiology and "first aid," dressmaking, and cookery. When manual work was first introduced into the syllabus the subjects taken were often treated as isolated and complete in themselves, but a better knowledge of correlation has gradually spread, and we now seldom find schools where the programmes in drawing and handwork are not co-ordinated with other subjects of the syllabus.

The cookery classes have been continued as before under Mrs. Neeley in the city and Miss Talbot in the country. The latter succeeded Miss Millington, who resigned to take up similar duties elsewhere, after several years of successful and arduous work in the districts of Wairarapa North and South. The centre at the Terrace has been removed to the Normal School, and when the South Wellington building is finished the Newtown centre will be removed there. An excellent cookery room has been added to the Masterton School, and provision has been made for one at Carterton. One of the rooms of the old Greytown School should also be fitted up for this purpose, and when this is done children from other schools in the Wairarapa might very easily be taken to one of these three centres for lessons. A centre will shortly be established at Levin, and provision should also be made to give the girls at Petone and the Hutt an opportunity of obtaining lessons in cookery.

The Department made grants for the establishment of woodwork centres at Thorndon and South Wellington. An instructor has been appointed, who will shortly be at work. Similar centres should be established in the Wairarapa.

Extract from the Report of the Education Board's Instructor in Agriculture.

At the end of 1905 recognised classes in agriculture, combined with cottage-gardening, were being conducted in 15 schools. During the past year the number has increased to 42. At all of these garden-plots have been established, and four — viz., Masterton, Carterton, Greytown, and Mauriceville West—now possess suitable laboratories in which individual experimental work in agricultural chemistry and plant-physiology may be carried out by the pupils. My regular weekly engagements have been—one day at the Wellington Technical School, half a day each at the Carterton and Greytown District High Schools, and, during the last seven months of the year, a teachers' Saturday class in Masterton, and an evening class for adults at Greytown. Seventy visits have also been paid, as opportunity has offered, to other schools at which work is in progress. The instruction has been on the lines laid down for the first year's work in the circular issued by the Board in March last, and has consisted chiefly of practical work in the garden, accompanied by lessons on the chemistry of air and water, as related to the growth and requirements of plant-life, the structure of plants and the duties performed by their various parts, the nature and sources of plant-food, and observations on the weather, including the compilation of meteorological charts and calendars. In some schools, especially those which commenced operations late in the year, little has been accomplished beyond the manual labour of preparing and planting plots—a task, in several instances, of an exceedingly arduous nature. The cheerful manner in which the demands thus made have been met by teachers and pupils alike augurs well for success in the future, when the difficulties inseparable from the initial stages have been overcome. In accordance with the desire of the Board, special attention has been given to the district high schools in the country districts, with a view to making them centres for agricultural instruction. The three principal centres in the Wairarapa are now amply provided with laboratories and outdoor equipment, the grants made by the Department having been liberally supplemented by donations of both land and money from local bodies. The plots at the Masterton District High School supply an excellent example of what may be accomplished by skill and determined effort in the conversion of a stony waste into a smiling garden, and reflect great credit on the efforts of master and pupils; while at Carterton the successful establishment of luxuriant vegetation on a site formerly devoted to the manufacture of bricks is also a pleasing evidence of patience and perseverance. The next important centre to receive attention will be Levin, at which place the laboratory is approaching completion, and it is hoped that within the year circumstances will permit the extension of operations to Pahiatua. A Saturday class for the convenience of teachers in the Wairarapa and Forty-mile Bush districts was commenced in June last, and continued till the end of the year, with a weekly attendance of from thirty to forty. The varied composition of the class, which comprised all grades from headmasters to pupil-teachers, rendered it impossible to go beyond the elementary stages of agricultural chemistry, the more salient features in the structure, growth, and habits of plants, and instruction in the manipulation of apparatus. Individual experimental work formed an important feature of the course, and the interest displayed showed that even the older members, to whom much of the work was necessarily not new, appreciated the opportunity of acquiring the manual dexterity in performing experiments which is so important a part of a teacher's equipment. Lists of the experiments carried out were issued from week to week, and I trust that these, though not intended to serve as a programme of work for school use, may still form a useful source of material to teachers when preparing lessons, besides affording some indication of the class of experimental work desired.

The size of the Masterton class formed a serious obstacle to really effective individual work, and it will be necessary to devise some means of remedying this defect during the present year. One plan suggested is to limit the attendance to those teachers likely to utilise their agricultural knowledge in the immediate future. Another, and one that seems both fair and practicable, is to hold two courses this year—one at Greytown, for the benefit of the district south of Masterton, and another at Pahiatua, which would serve the northern half of the district. This would afford well-earned relief to those teachers who last year sacrificed much time and comfort to attend the Masterton class, and would also reach many who could not be reasonably expected to travel to Masterton. The evening class, held at Greytown once a week since June, has been attended by eighteen adults, whose interest has amply justified its establishment. A portion of the school section has been set aside for the use of members who have, during their spare time, carried out a number of experiments which cannot fail to be instructive to the district at large and to the pupils of the school in particular. It is pleasing to note that the results of agricultural instruction are already visible in some of the fields of the neighbourhood, where the knowledge acquired in the laboratory is being put to a practical test.

While it is yet too early to form an adequate estimate of the advantages to be derived from nature-study in its agricultural aspect, evidence is not wanting to show that, where taken up in the right spirit and with due regard to its relation to the rest of the syllabus, not only need it not prove burdensome to teacher and pupil, but it may become in every way an assistance and a source of inspiration. The lessons to be derived from the garden will naturally vary as the work progresses. Although during the first six months there is apparently scope for little beyond physical exertion, much may be learned incidentally as to the nature of soil, the reason for the methods employed in preparing the plots, and the causes which produced the particular class of soil under cultivation. It is needless to suggest to the thoughtful teacher the possibilities here opened up for a series of lessons in geography, embracing natural features and agencies stretching from the mountain-tops to the ocean-beach, and all connected, directly or indirectly, with the garden-plot. The plan of the garden and the arrangement of the rows will afford opportunities for exercises in drawing, while in the measurement and calculation of areas of plots, paths, &c., and the computation of quantities and cost of seeds, manures, crops, &c., per acre may be found material for numberless problems in arithmetic. In this connection I would suggest that a suitable size of plots for a large school is 33 ft. by 11 ft., which gives exactly $\frac{1}{120}$ of an acre, thus facilitating arithmetical calculations. For small schools and localities where space is limited half the size would suffice. As the season advances, and the crops make their appearance to add to the interest of the garden, the work of comparing results and taking notes needs attention, and all the time there is going on the steady formation of habits which should last the child through life—habits of neatness, industry, observation, patience, and a love of Nature and all her wondrous ways. With regard to the indoor work, space will only permit me to say further, that it should be treated as experimentally as circumstances will allow, and that one simple experiment carried out by the child personally, and the results of which are noted carefully, is worth many elaborate ones in which the pupil has no share. It is surprising how many valuable experiments, especially in plant-life, may be carried out with such simple appliances as a few pots and bottles and a shelf in the corner of the schoolroom. It is a matter of regret that the Government grants to classes in agriculture are not adequate to the requirements. The initial grant of 10s. per head up to £7 10s. is not more than sufficient to buy tools and perhaps provide part of the cost of fencing the garden-plots, leaving nothing for the purchase of apparatus for illustrating indoor lessons. Many of our teachers have, with praiseworthy effort, raised small sums by means of entertainments, and in this way, with the aid of the pound-for-pound subsidy granted by the Department, have provided the necessary apparatus. Gratifying as this exertion on the part of the teachers undoubtedly is, it cannot in fairness be expected that they should thus add to their already considerable burden of work, and it is to be hoped that more liberal provision will ere long be made in the way of an increased initial grant and a higher rate of capitation. If the former were raised to 12s. 6d. and the latter to 5s. per head, the requirements of the case would, I think, be met. In conclusion, I wish to express my thanks to the Town Lands Trust and other local bodies in the Wairarapa for their substantial monetary assistance to the High School classes; to the School Committees and the A. and P. Associations for the kindly interest and practical encouragement they have extended to the rural education movement; to Mr. Thomas Horton, of Pahiatua, who gratuitously provided the teachers' class with a day's valuable instruction and practice in grafting, budding, pruning, and other horticultural operations; and finally to the teachers, without whose sympathy and willing co-operation the cheering results of the past year could not possibly have been achieved.

WM. C. DAVIES.

EXTRACT FROM THE REPORT ON THE CARTERTON TECHNICAL CLASSES.

Classes in English, arithmetic, book-keeping, shorthand, and drawing were held. The number of pupils in all classes was small. The average attendance for the English and arithmetic class was seven. The English literature book taken was "A Tale of Two Cities." The programme for the commercial class was altered to include also *précis* and commercial correspondence, and commercial arithmetic and shorthand was dropped owing to there being only three pupils. The average attendance for this class was about six. The School Committee was approached by local employers to request the establishment of a class for mechanical drawing. This class met for one term, and the work done was highly commended by the employers. The average attendance was about six. Although the attendance at all classes was small, yet the Committee considered that it was advisable to keep the classes going even at a loss in the hope that in 1907 there would be a decided improvement. This hope has been realised. As a result of the year's work it has been found that four terms' work is too much in one year, and in future three terms of about twelve lessons each will be arranged. The Committee has every confidence that the staff have carried out their duties with great efficiency during the year.

Statement of Receipts and Expenditure for the Year ending 31st December, 1906, in respect of Special Classes conducted at Carterton.

Receipts.	£ s. d.	*Expenditure.*	£ s. d.
Balance at beginning of year	45 2 2	Salaries of instructors	67 2 0
Capitation on classes	52 19 0	Office expenses (including salaries, stationery, &c.)	13 5 6
Fees	8 10 0	Advertising and printing	3 7 0
Voluntary contributions	7 7 0	Lighting and heating	0 11 6
Plumbers' donation, £10 (afterwards refunded, less costs)	10 0 0	Insurance and repairs	0 3 0
Sale of material	2 16 0	Material for class use	19 10 9
Balance at end of year	19 18 4	Instructors' train fares	1 1 8
		Balance of plumbers' donation	7 18 0
		Alterations to building, trees, labour, &c.	32 19 1
		Incidentals	0 14 0
	£146 12 6		£146 12 6

G. L. STEWART.

Statement of Receipts and Expenditure for the Year ending 31st December, 1906, in respect of Special Classes for Teachers conducted at Masterton.

Receipts.	£ s. d.	Expenditure.	£ s. d.
Furniture, fittings, apparatus	52 6 11	Material for class use	12 14 2
Material	9 1 1	Furniture, fittings, apparatus	58 1 9
Balance at end of year	9 7 11		
	£70 15 11		£70 15 11

G. L. STEWART.

EXTRACT FROM THE REPORT OF THE MANAGERS OF THE PETONE TECHNICAL CLASSES ASSOCIATION.

The Board of Managers, in issuing the third annual report, have much pleasure in stating that satisfactory progress has been made in the various classes established in connection with the school. A very large number of "free place" students are availing themselves of their privileges by attending the classes. The managers hope that parents and the young people of the district will recognise the real practical benefit a course of study in our school confers, and that the number of students year by year will show a steady increase. The annual reports submitted by the teachers of the various classes were considered very satisfactory. The difficulties under which the classes have laboured owing to the lack of proper accommodation is a matter generally touched upon. For instance, the instructor of the mechanical drawing and machine-design class writes, "I feel quite certain that if a proper class-room were provided, and a few models and diagrams, many more young men would attend this class." Three students of this class prepared for and passed the examination for third-class engineers' certificates. There were thirty pupils in the shorthand, typewriting, and correspondence class. The instructor reports that while some of the pupils made excellent progress—in two instances shorthand was mastered in one quarter—others were most unsatisfactory, particularly the boys. Considering the number of pupils passing through the various city schools each year, it was a matter for congratulation that four Petone pupils had been successful in obtaining employment in Wellington in the last quarter as shorthand-writers and typists. Free pupils were the greatest source of anxiety, inasmuch as in their endeavour to secure the free tuition in shorthand, &c., they had to attend other classes, and were consequently at the school almost every evening in the week, leaving no time for shorthand practice, without which it was impossible to become proficient, and the ultimate result was that, being so long learning, they became tired of it and gave in, to the discredit of the school. It might, however, be possible to compensate for this to some extent by providing an assistant instructor. It was possible to carry on the classes hitherto, but with disappointing results, and if the class was to fulfil its mission—viz., to fit pupils for a commercial life—some steps should be taken to compensate for the disadvantages under which they laboured.

The instructress to the dressmaking class reported that the classes had been well attended, and the students had taken great interest in their work.

The instructor reported that the progress of the drawing and the painting pupils had far exceeded expectations, considering the extreme youth of the pupils. A large majority had progressed in a marked degree, whilst some five or six had made excellent progress. The attendance and conduct generally had been all that could be desired.

The instructor of the carpentry and building-construction classes emphasized at the outset that the classes were working under circumstances that could not but affect the attendance and the amount of good to be imparted to pupils. The work done had been fairly satisfactory.

The instructor of the continuation classes stated that the attendance was more regular than in the previous year, and, with the exception of four unambitious juniors, all showed a willingness to progress. In mathematics the majority seemed bent on strengthening their calculating-powers. There was, however, room for a purely commercial course in arithmetic, which could be run together with the theory taken by the remaining students. For solid geometry an improvement could be effected by obtaining a set of models.

The students in the plumbing class made very fair progress, but there was the usual difficulty in getting them to take a deep interest in the theory of the subject.

Statement of Receipts and Expenditure for the Year ending 31st December, 1906, in respect of Associated Classes conducted at Petone.

Receipts.	£ s. d.	Expenditure.	£ s. d.
Balance at beginning of year	202 0 1	Salaries of instructors	277 9 0
Capitation on associated classes	113 16 6	Office expenses (including salaries, stationery, &c.)	1 7 7
Rent	40 4 0	Advertising and printing..	13 14 2
Subsidies on voluntary contributions ..	79 18 0	Lighting and heating	18 16 4
Fees	147 19 3	Insurance and repairs	15 2 4
Voluntary contributions	80 0 0	Rent	52 14 0
Other receipts	5 7 9	Material for class use	26 18 8
		Caretaker	13 9 3
		Cheque-books and bank charges	0 18 6
		Cartage..	1 18 6
		Fees refunded to free-place pupils ..	38 5 0
		Furniture, fittings, apparatus	32 7 0
		Balance at end of year	176 5 3
	£669 5 7		£669 5 7

W. G. LODDER, Chairman } of Managers.
J. G. CASTLE, Secretary }

Extract from the Report of the Director of the Wellington Technical School.

Attendance.—Excluding day technical free scholars, numbering 276 on the average, the number of class entries averaged 934 in the four quarters of the year. These were distributed as follows: Art and art crafts, 234; mechanical and electrical engineering, 118; plumbing, painting and decorating, carpentry and joinery, and building-construction, 227; mathematics, mechanics, geometry, and mechanical drawing, 116; English, Latin, and arithmetic, 74; tailor's cutting, 5; commercial, 160.

Art Classes.—These classes were seriously handicapped during the year through the absence of a chief instructor, and through the general unsuitability of the rooms used. There should be considerable improvement in the quality of the work done during the year 1907, and also in the general direction and scope of the teaching; but the numbers will probably not increase till the good effects of well-arranged courses and high ideals begin to show. The art-work done was not confined to the ordinary art students during the year 1906, the whole of the day technical scholars taking four hours weekly of elementary drawing, with, on the whole, satisfactory results.

Mechanical and Electrical Engineering.—These classes showed more promise than in former years. I would, however, strongly urge that a suitable drawing office and laboratory accommodation be provided, in order that the best type of student may be attracted and retained by the school. No real progress can be made in arranging courses and in compelling the attendance of apprentices till at least some of the necessary laboratory rooms and equipment and drawing-office accommodation has been provided. The present shortcomings in these respects almost entirely nullify the efforts of both staff and students, and tend to drive promising young men to other countries to obtain the whole of their training, with the natural result that they often fail to return to this country, which is left with a large proportion of incompetent and badly trained workmen. Proper appliances are absolutely necessary if good advanced classes are to be established, and without such classes the courses are of very moderate utility and really earnest students are not attracted.

Building Trades.—The attendance in these classes was good during the whole year, and the quality of work done very fair. The same general criticism applies to this branch of the school as it does to the engineering branch. Good teachers and good students were handicapped by lack of room and equipment.

Mathematics, Mechanics, and Mechanical Drawing.—The numbers were fair and the work done good considering the circumstances in which the work was done. Special rooms and special equipment are very necessary, and were not available.

Continuation Classes in English, Latin, and arithmetic were well attended, and the results showed careful teaching, and also earnest work on the part of many of the students.

Book-keeping, Shorthand, Précis, *and Typing* were amongst the most successful classes in the school, and were well attended both by day and evening students.

Day Technical Scholars.—The classes for free technical students in the daytime were well attended, and good progress was made. A large proportion of the second-year students remained till the end of the year, and were successful in obtaining senior free places. These are now attending the school in more advanced classes both day and evening. The demand for these students in business and industrial concerns in the town has been very strong, and good reports have been received of all who left the classes to go to work. In many cases firms engaging one of the second-year students have been so well pleased that they have sent to the school for others.

The new workships were equipped during the year, and have been found convenient and suitable. The furniture and equipment of the main buildings have been as far as possible perfected, and the available space fully utilised. It becomes increasingly evident, however, that the school is being badly throttled by cramped and inconvenient buildings and lack of breathing-space. A convenient area for recreation is a very urgent necessity for both day and evening students, and the available class-room is only about one-third of that required for properly carrying on the work. There is no doubt that a change of site is inevitable, and the sooner the change is made the sooner good results will be obtained from the annual expenditure. The removal of the school to suitable buildings on a sufficiently large site would be followed by a large increase in numbers and efficiency.

In accordance with the desire of the Education Department, students of the school sent some 160 exhibits to the International Exhibition at Christchurch. Over fifty awards were obtained, including eleven gold medals.

W. S. La Trobe, Director.

Statement of Receipts and Expenditure for the Year ending 31st December, 1906, in respect of Associated Classes conducted by the Wellington Technical Classes Association.

Receipts.	£	s.	d.	Expenditure.	£	s.	d.
Balance at beginning of year (including contractor's deposit, £100)	476	5	6	Salaries of instructors	4,719	10	1
Capitation on associated classes	3,543	1	10	Office expenses (including salaries, stationery, &c.)	30	16	8
Capitation on account of free places	1,369	8	10	Advertising and printing	185	18	4
Buildings	2,367	0	0	Lighting, heating, and cleaning	395	15	3
Rent	58	11	6	Insurance and repairs	86	16	4
Furniture, fittings, apparatus	2,043	2	7	Rent	40	0	0
Material	274	1	5	Examinations, &c.	129	14	2
Subsidies on voluntary contributions	445	1	2	Material for class use	528	5	4
Fees	1,421	5	9	Library	52	4	5
Voluntary contributions	430	19	2	Appointment of instructors and travelling-expenses to New Zealand	119	7	5
Rent from Victoria College	21	13	4	Sundries	46	5	10
Drawing classes, Wellington Boys' and Girls' Colleges	120	0	0	Deposit refunded	100	0	0
Sales, waste material	105	5	6	Contracts (new buildings, additions, &c.)	2,815	18	3
Sundries	28	9	9	Architect, &c.	157	15	0
				Furniture, fittings, apparatus	2,042	13	8
				Balance at end of year	1,253	5	7
	£12,704	6	4		£12,704	6	4

W. S. La Trobe, Secretary.

Extract from the Report of the Managers of the Masterton Technical School.

The work of the year was commenced in the week beginning Monday, 12th March, when classes in the following subjects were established: Drawing, painting, dressmaking, woodworking, wood-carving, plumbing, commercial work, English and arithmetic, and Civil Service subjects. The year was divided into three terms of twelve weeks each, and in all fourteen classes were formed. The attendance of pupils at the respective classes may be regarded as satisfactory, the average roll-number for the three terms being 238, whilst the average number of pupils in attendance was 167. In this connection the attendance of pupils at the English and arithmetic class—the compulsory subjects for holders of junior free places—was particularly good, thirty-eight out of a total of forty-seven succeeding in complying with the regulations in regard to the attendance of free students. It was mentioned last year that free students under the Junior Technical Scholarship Regulations were admitted for the first time. This year the number of free students was very largely augmented, no less than forty-seven scholarship-holders being admitted to the classes. This large influx of free students had the effect of, for a time at any rate, causing the work to be carried on at considerable inconvenience owing to the lack of sufficient accommodation, and if, as is only too probable when the classes open for the current year, a further large number of pupils entitled to hold free places present themselves for admission, considerable difficulty will be found in arranging for their instruction.

At the recent examinations held by the Education Department four of the pupils attending the Civil Service class succeeded in passing the Junior Civil Service Examination, one of the four passing with credit, whilst in the plumbers' class six students succeeded in gaining the plumbers' certificate issued by the Wellington Technical Education Board. Three members of the plumbers' class also succeeded in passing the examination of the City and Guilds of London Institute, two out of the three passing in the ordinary grade and the other securing a pass in the preliminary examination. In March last a very successful exhibition of the work done by scholars at the Technical School was held in the workshop in Dixon Street, and was largely attended by the public, who evinced great interest in regard to the nature and quality of the exhibits placed before them.

Reference has been made in previous reports to the uncertain nature of the tenure of the present Technical School, and as time goes on, and the scope of the work expands, the difficulties occasioned by the unsuitability of the premises and the lack of adequate accommodation are becoming more and more accentuated. In this connection it is now almost imperative that some movement in the direction of inaugurating a workable scheme for the establishment of a building fund be taken at an early date, and the Managers will therefore be only too pleased to consider suggestions as to the manner in which the desired end may be attained.

A glance at the accompanying statement of receipts and expenditure for the year ended the 31st December, 1906, reveals the fact that the receipts from all sources amounted to £703 7s. 10d., whilst the expenditure for the same period totalled £692 3s. 3d., thus leaving a balance of £11 4s. 7d. to be carried forward to the current year's operations. The position thus disclosed is the more satisfactory in view of the fact that on the 31st December, 1905, the school's banking account was overdrawn to the extent of £83 5s. 4d.

The Managers desire to take this opportunity of thanking the Trust Lands Trust, who again generously voted the sum of £100 in aid of the maintenance of the classes during the past year; the Masterton Borough Council for their grant of £25 in aid of the lighting and heating of the rooms; and the Education Department for the very considerate manner in which the school has been treated throughout the past year. Largely owing to the assistance thus received the work of the school has been rendered possible, and, although at present still hampered by the unsuitability of its situation and the insufficiency of its accommodation, there is every reason for the hope that, as the result of a vigorous and combined effort, it will develop into such an institution as will prove of lasting benefit to the town and district.

Edwin Feist, Chairman.
N. D. Bunting, Secretary

Statement of Receipts and Expenditure for the Year ending 31st December, 1906, in respect of Associated Classes conducted by the Masterton Technical Classes Association.

Receipts.	£	s.	d.	*Expenditure.*	£	s.	d.
Capitation on associated classes	188	13	9	Balance at beginning of year	83	5	4
Capitation on account of free places	86	10	6	Salaries of instructors	452	5	0
Rent	13	0	0	Office expenses (including salaries, stationery, &c.)	45	0	0
Furniture, fittings, apparatus	23	1	1	Advertising and printing	8	11	2
Material	4	11	0	Lighting and heating	23	3	1
Subsidies on voluntary contributions	133	6	0	Insurance and repairs	1	10	8
Fees	103	0	0	Examinations, &c.	0	10	6
Voluntary contributions	137	14	6	Material for class use	19	8	9
Rent for use of rooms	4	14	6	Prizes	9	14	6
Sale of scrap lead	7	9	0	Caretaker	14	17	0
Refunds	1	7	6	Petty cash, &c.	1	6	0
				Cartage	2	7	6
				Bank charges and interest on overdraft	3	17	5
				Amount overdrawn on cheque for sundry accounts	0	7	6
				Furniture, fittings, apparatus, &c.	25	18	10
				Balance at end of year	11	4	7
	£703	7	10		£703	7	10

Edwin Feist, Chairman
N. D. Bunting, Secretary } of Managers.

HAWKE'S BAY.

Extract from the Report of the Inspector of Schools.

The instructors in woodwork, cookery, and dressmaking—viz., Mr. Gardiner, Misses Ivey and Lousley, and Mrs. Thomas—have sent in reports on the special work done during the year, from which the following summary is made:—

Mr. Gardiner says that "Classes in woodwork were held throughout the year at Napier and Hastings as centres. Two hundred and twenty pupils received instruction in nine separate classes. Two special classes were carried on, also a teachers' Saturday class. Owing to the lack of adequate accommodation and appropriate equipment the classes were conducted under extremely disadvantageous circumstances. The attendance and progress at the special evening classes in mechanical and architectural drawing has been very encouraging, but these classes will never fulfil their legitimate functions until the school is provided with sufficient and suitable models to enable the teaching to be from the concrete to the abstract, from things to principles. In view of the erection of a new technical school for Napier, and the extension of manual, training, and technical classes in other centres, proposals will be submitted for realising in some measure one's own ideals in this direction."

Mrs. Thomas reports having given instruction to 321 girls in eight schools in the southern portion of the district during the first six months of the year, and to 209 girls belonging to the Gisborne District High School and certain country schools in the Poverty Bay district during the second half of the school year, alternating her instruction with the instruction in cookery. She points out certain inconveniences in several schools, and considers that schools where dressmaking classes are carried on should be provided with a separate room and such necessary materials as paper for drafting, tape measures, tracing-wheels, scissors, and sewing-machines, all of which are necessary for progress of work.

It will be observed that the special instruction, important as it is, benefits but a comparatively few of the senior boys and girls in the district. Under present arrangements much difficulty is experienced by instructors in visiting even the larger schools, but the difficulties will be minimised when the technical-school buildings now in course of erection are finished at Napier, Dannevirke, Waipawa, and Hastings. It is doubtful, however, whether more pupils will be instructed under the improved conditions. The smallness of the country schools presents a difficulty to the introduction into them of manual and technical training. It would be a very good thing to foster in all country schools a knowledge of elementary agriculture, including soils, rocks, native plants, and common weeds as far as each district is concerned. But specialists must do the work in the country just as they do in the towns. If education is to have a utilitarian bias in the schools it should be in the direction of adaptation to environment and probable future needs. Itinerant teachers could do the work in the country, and by a slight modification in the present manual and technical regulations dealing with "school classes" it would be possible for a teacher to instruct the senior pupils belonging to twenty or more schools during the year.

The large attendance of teachers at the Saturday classes in elementary agriculture, such as were held in Napier at the beginning of the year, shows that the teachers are alive to the importance of this subject as a branch of instruction in the schools.

Statement of Receipts and Expenditure for the Year ending 31st December, 1906, in respect of Special Classes conducted at Dannevirke, Gisborne, Hastings, and Napier.

Receipts.	£ s. d.	Expenditure.	£ s. d.
Balance at beginning of year	175 2 7	Salaries of instructors	517 18 6
Capitation on special classes	244 10 7	Office expenses (including salaries, stationery, &c.)	47 17 5
Capitation on account of free places	0 19 6	Advertising and printing	25 3 0
Rent	138 19 2	Lighting and heating	16 8 1
Furniture, fittings, apparatus	5 16 8	Rent	144 12 6
Material	64 6 4	Examinations, &c.	9 18 6
Subsidies on voluntary contributions	100 0 0	Material for class use	62 2 7
Fees	159 2 10	Teachers' fares	17 7 6
Voluntary contributions	100 0 0	Cleaning	10 18 0
Sale of scrap lead	4 10 0	Furniture, fittings, apparatus	6 18 0
Government grant (teachers)	250 0 0	Balance at end of year	398 8 0
Transfer from Technical Fund	14 4 5		
	£1,257 12 1		£1,257 12 1

G. Crawshaw, Secretary.

Extract from the Report of the Technical Classes conducted by the Gisborne High School Board of Governors.

In conjunction with the Hawke's Bay Education Board, the Gisborne High School Board, as controlling authority in Poverty Bay, carried on for the first half of the year school classes in cookery and woodwork, and for the second half classes in dressmaking and woodwork, at which pupils from the following schools received instruction: Gisborne, Mangapapa, Makauri, Wairangaahika, Ormond, Kaitiratahi, Tikaraka, Matawhero, Te Arai, Patutahi, and Maraetaha. Two hundred and thirty-two boys attended the woodwork classes, and 224 girls the cookery and dressmaking classes. Those living contiguous to the railway-line were carried free, whilst the fares of those served by coach were paid by the Technical Classes Committee.

The Department kindly renewed permission for the pupils from the country schools to attend one day a fortnight, taking two lessons on the same day, an arrangement that worked very well, and which we hope to see continued.

There was also a class for physics, which was attended by the pupils of the Gisborne School only.

Continuation classes in English, book-keeping, shorthand, and typewriting were carried on, but again the attendance was disappointing. We are in hopes that as our young people come to more fully realise the benefits to be gained by attending these classes the number of pupils will increase, but we much regret the apathy shown by parents and young people.

Special classes in woodwork for amateurs, and also for the Maori students attending Te Rau College, were fairly well attended. Steps taken to form trade classes for those engaged in the building trade and carpentry met with no response. There was also a class for instruction in wood-carving. Classes in dressmaking were held for (*a*) girls under eighteen residing in town, and (*b*) girls of the same age residing in the country, the latter being the most popular. There was also a class for adults in the same subject. At the close of the session an exhibition of the work done by the pupils attending these and also the school classes was held, when some excellent work was shown, the visitors expressing themselves highly pleased with the quality of the work. Adult classes in cookery were not taken advantage of. During the year a Shacklock range was fitted in the cookery room, so that instruction is now given in the use of both gas and coal stoves. An attempt was made to inaugurate some system of rural technical instruction for the country schools, but owing to lack of support the idea was abandoned. We hope that some comprehensive scheme may be brought forward during the coming year which will provide instruction in this direction for the benefit of our farming community. The classes for teachers in woodwork, cookery, and dressmaking were not very well attended, but some of the teachers attended very regularly, with good results. Specimens of work done by the boys attending the woodwork classes were sent to the Christchurch Exhibition for inclusion in the exhibit of the Department.

We desire to thank the Gisborne Borough Council and Mr. A. Webber for donations to the funds of the classes.

W. Morgan, Secretary.

Statement of Receipts and Expenditure for the Year ending 31st December, 1906, in respect of Special Classes conducted at Gisborne by the Gisborne High School Board of Governors.

Receipts.	£	s.	d.
Balance at beginning of year	11	18	1
Capitation on classes	501	12	11
Buildings	15	0	0
Furniture, fittings, apparatus	4	16	11
Subsidies on voluntary contributions ..	21	16	0
Fees	74	3	3
Voluntary contributions	21	16	0
Grant by Education Board towards salary of instructor of teachers' cookery classes ..	25	0	0
Transfer from Secondary Account High School	10	0	0
Sale of material	4	18	8
High School Board of Governors—For buildings, furniture, &c.	21	18	10
	£713	0	8

Expenditure.	£	s.	d.
Salaries of instructors	410	9	8
Office expenses (including salaries, stationery, &c.)	25	18	6
Advertising and printing	14	19	6
Lighting and heating	15	17	2
Insurance and repairs	2	6	0
Material for class use	60	12	4
Caretaker and cleaning	19	11	0
Fares of instructors	3	12	6
Cartage, freight, and wharfage	1	2	9
Repairs	6	12	3
Coach fares to and from classes	100	10	3
Contracts (new buildings, additions, &c.) ..	30	0	0
Architect, &c.	2	2	0
Furniture, fittings, apparatus	9	13	9
Balance at end of year	9	13	0
	£713	0	8

W. Morgan, Secretary.

MARLBOROUGH.

Extract from the Report of the Inspector of Schools.

Handwork.—Forty-one schools undertook handwork of some description. There were 18 in 1904, and 29 in 1905. The remaining schools are very small. It may, however, be observed that there is no school too small to use concrete methods in teaching. To omit handwork is, therefore, to show that its idea is not grasped—*e.g.*, to use plasticine in order to plot a map in relief is surely a pleasing and instructive variation on the usual drawing of a map, and the mere fact that plasticine is used instead of the pencil cannot constitute this a new subject; so also when plasticine is used to illustrate the mensuration of walls or cubic content, or when bricks are used in drawing plans and elevations and in illustration of scale-drawing.

Ambulance and First Aid.—An incident of the past year is worthy of inclusion here: A child had fallen into a water-race, and after several minutes' immersion was recovered unconscious. Among the bystanders was a schoolboy who had been taught first aid, and under his direction the child was brought round. Some consider that but for the presence of that boy the accident would have ended fatally.

Elementary Agriculture.—In 1904 there were 6 school gardens; in 1905 the number had increased to 17; and now there are 24, including 3 at private schools. The teachers have taken a keen interest in this late departure, and, as Mr. Bruce, our specialist in agriculture, says, they realise that it affords much help in dealing with the other work. Through the study and cultivation of plants the children acquire habits of observation and orderliness—the causal idea, the idea of planning work to ends, the idea of the inevitableness of natural results—which also tends to affect conduct in the schoolroom. Objects are taken from the garden to be used as studies in drawing; topics for essay-writing also abound. Diseases of plants are studied, and indirect lessons on human health taught. The school garden is a laboratory where many experiments are made. Waitohi, Tuamarina, Grovetown, and Springlands appear to have made the most of their garden from this point of view. In short, the teachers find that agriculture is not only a technical science, but that it can be made a valuable means of education. The teaching in general also appears gradually to become more scientific. The total grants for the year by way of initial capitation for tools amounted to £60. It were well if the Department could see its way to grant capitation for this branch of science in Standard III also, as that class naturally goes with the upper standards in schools staffed with two teachers. This ought to be readily granted, for, as mentioned above, we do not propose to teach agriculture as a technical subject, but as a concrete medium of education. Viewed in this way the subject has claims for capitation from the lowest class. The London *Times* during 1905 interested itself greatly in "rural education," and obtained, among others, a special report on "Developments in England." According to the writer, "From an educational point of view it seems unfortunate that the Government grant is only given for boys over eleven years of age, and that it is only possible for so few boys to learn. Gardening should be a part of the general curriculum of the rural school, as it is in the Macdonald schools in Canada, not a subject for the few." The Board recognised that a school does not do its duty to the community in which it is situated if its curriculum tends to divorce the feelings of the pupils from the calling of the locality. Hence its ready support of the proposal to join with Nelson, Grey, and Westland in engaging an expert to foster the teaching of elementary agriculture. This led to the appointment of Mr. Bruce, who has expressed himself highly pleased with the progress made and with the spirit manifested by the teachers in the attempt to adapt the science to the ends of education. The annual report (1906) of the Board of Agriculture, England, which has been kindly placed in my hands by Mr. Chaytor, refers to school gardens. According to this there are upwards of four hundred scattered over thirty-two counties. The gardens vary from one-eighth to half an acre, with, roughly, 1 rood to each pupil. The largest number learning gardening at any one school was fifty-six, and the smallest five. Two hours a week were said to be devoted to gardening. In various places throughout the kingdom are also evening-school gardens. Many universities and colleges provide teachers' courses and extension lectures. The experience of other countries is valuable, for it frequently gives us suggestions for our own use.

School classes in *Cookery* were successfully continued at Fairhall and Marlboroughtown Schools. The former captured five medals at the New Zealand Exhibition, one exhibitor—a boy—taking first prize in an open class.

During the past year the technical school in Blenheim was opened, and school classes in cookery organized under the capable management of Miss McIntosh. The Department arranged for passages on the railway, and thus pupils were enabled to come from Picton, Waitohi, and Tuamarina to Blenheim. Springlands, Blenheim, and Marlborough High School also sent classes, and the cookery room has thus made a prosperous beginning.

Woodwork.—Difficulties in regard to an instructor hindered the opening of the woodwork room, but this subject, too, is now making headway.

Other Classes.—Evening classes in arithmetic, English, book-keeping, brush drawing, commercial arithmetic, commercial geography, algebra, and singing were held at two schools.

Marlboroughtown excelled during 1906 in the handwork exhibits of the agricultural and pastoral show. Not only brush drawing, plasticine, &c., but cookery and many varieties of preserves made an admirable collection.

Statement of Receipts and Expenditure for the Year ending 31st December, 1906, in respect of Special Classes conducted at Blenheim, Canvastown, Havelock, and Picton.

Receipts.	£	s.	d.	*Expenditure.*	£	s.	d.
Capitation on special classes	26	16	10	Balance at beginning of year	11	7	4
Capitation on account of free places ..	2	11	6	Salaries of instructors	36	16	5
Furniture, fittings, apparatus	10	0	0	Advertising and printing	4	4	8
Fees	15	0	0	Lighting and heating	4	15	9
Special grants for instruction of teachers ..	125	0	0	Material for class use	2	17	7
Sale of material	2	1	4	Cleaning and attendance	1	2	0
				Furniture, fittings, apparatus	18	17	0
				Balance at end of year	101	8	11
	£181	9	8		£181	9	8

JOHN SMITH, Secretary.

NELSON.

EXTRACT FROM THE REPORT OF THE EDUCATION BOARD.

The Nelson Technical School has been fairly well attended during the year, no marked falling-off in attendance at the various classes having taken place except in those for architectural and mechanical drawing. During the year classes have been held in the following subjects—viz., architectural and mechanical drawing, woodwork, dressmaking, plumbing, drawing, painting, modelling, cooking, wood-carving, and mathematics; continuation classes in English, arithmetic, French, shorthand, and book-keeping. A commercial class comprising shorthand, typewriting, and book-keeping was commenced during the year, and is very much appreciated.

Technical classes have also been held at the following schools: Reefton, dressmaking; Wakefield, cookery, dressmaking, and a commercial class comprising shorthand, typewriting, and book-keeping. School classes for dressmaking and cookery have been held at Richmond and Wakefield, and for cookery and woodwork at the Nelson Technical School, dressmaking being taught at the Toitoi Valley School. School classes in cookery, woodwork, and dressmaking have also been held at the Reefton Technical School. Teachers' classes in the following subjects have been held in Nelson—viz., drawing, woodwork, wood-carving, physics, and chemistry.

In thirty-nine of the public schools of the district, including nearly all the larger schools, handwork has been taught in one or other of its many forms. A building for technical-school purposes has been erected at Wakefield, and the technical classes, which during the past year have been held at great inconvenience in the kitchen of the teachers' house and in the old school building, will be transferred to the new school on the reassembling of the pupils after the hop-picking holidays.

Technical School and School of Mines for Westport.—The Board has again to express its regret that no progress has been made during the year in this matter, but it is hoped that after the recent interview with the Minister of Mines, the committee of the School of Mines, and a representative of the Education Department, some definite decision will be arrived at. Westport is an important centre, and one in which such a combined institution should prove of incalculable value. It is only fair to record the fact that every endeavour has been made by the Board to accelerate the progress of this work.

Agricultural Instruction.—In conjunction with the neighbouring Education Boards of Marlborough, Grey, and Westland, an instructor in agriculture has been appointed in the person of Mr. James Bruce, lately of the Dunedin Technical School, and it is expected that this important subject will now be taken up with interest in most of the schools of these education districts. The instructor informs the Board that the institution of a chemical laboratory is an essential to the carrying-on of his work, and application for a grant for the building has been made.

Extract from the Report of the Inspectors of Schools.

Handwork.—Some form of handwork has been undertaken in 40 schools. Included in this number are all the schools in each of which two teachers are employed, and 8 under sole teachers, who as a class have shown commendable zeal in attempting one or more of the additional subjects. The treatment was considered satisfactory in 35 of these, and good in 9. In 34 schools the courses chosen embraced modelling in plasticine, brush drawing, elementary design and colour-work, brick-laying, stick-laying, paper-folding, or modelling in carton.

In 14 schools (two more than last year) swimming and life-saving are taught, and in 15 elementary physiology and first aid. The former might well be more general, and more attention should be given by lady teachers to the instruction of the girls. The bulk of the twenty lessons required could be easily got in by giving a half-hour lesson every afternoon during the first month of the school year, thus leaving but few to complete in November or December. A circular from the Department, dated the 8th November, calls attention to the urgent need for more general instruction, and we hope that the appeal will not be in vain. One form of encouragement given by the headmaster of the Nelson Boys' School is well worthy of imitation. He has of late years made a practice of bestowing upon each swimmer among his pupils a certificate stating the distance—25 yards, 50 yards, 100 yards, &c.—that the recipient can swim.

Elementary Agriculture, formerly cottage-gardening, has been attempted at five schools. Under the supervision and direction of the newly appointed instructor in agriculture we expect to see considerable extension and development under this head. All the above-mentioned classes are conducted by school-teachers.

Girls' school classes in cookery and dressmaking were conducted in Nelson, Westport, Reefton, Richmond, and Wakefield by special teachers who are not on the permanent staff. Classes for boys in woodwork have been similarly conducted at Nelson and Reefton. In expectation of botany and agricultural chemistry classes being formed, classes for the instruction of teachers in Nelson were limited to freehand, model, blackboard, and brush drawing, elementary physics and chemistry, and woodwork.

A technical school has been established at Wakefield, and there, or at Nelson or Reefton, manual and technical classes—that is, classes which are not confined to school-children—were held for instruction in wood-carving, mechanical drawing, woodwork, dressmaking, painting, architectural drawing, drawing from casts, modelling, plumbing, cookery, mathematics, and a commercial course (shorthand, book-keeping, and typewriting).

Continuation classes, which, as the name implies, are intended to enable children who have just left school to continue their studies in school subjects, of a Standard V or higher character, have been held in Nelson for arithmetic, English, book-keeping, French, and shorthand. The public-school teachers are best qualified for work of this character, and that they have not undertaken it more generally may be due to lack of enterprise or a disinclination to tax their spare time.

In fifteen schools, conducted by male sole teachers, needlework has been taught as a subject of manual and technical instruction.

Statement of Receipts and Expenditure for the Year ending 31st December, 1906, in respect of Special Classes conducted at the Nelson Technical School.

Receipts.	£ s. d.	*Expenditure.*	£ s. d.
Capitation on special classes	186 7 7	Balance at beginning of year	465 5 9
Capitation on account of free places	13 11 0	Salaries of instructors	401 8 5
Buildings	61 6 8	Office expenses (including salaries, stationery, &c.)	14 10 0
Furniture, fittings, apparatus	282 15 5	Advertising and printing	7 6 10
Material	29 9 5	Lighting and heating	25 8 7
Voluntary contributions	185 0 5	Insurance and repairs	1 3 6
Balance at end of year	259 11 4	Examinations, &c.	0 2 11
		Material for class use	36 10 9
		Typewriter and sundries	18 17 6
		Buildings	16 1 3
		Furniture, fittings, apparatus	31 6 4
	£1,018 1 10		£1,018 1 10

S. Ellis, Secretary.

GREY.

Extract from the Report of the Education Board.

Manual and Technical Instruction.—In August the authorised portion of the new Technical School building was completed, and for the remainder of the year two woodwork classes were held, with most gratifying results. This year advantage is being taken of the opportunities offered for the advancement of technical education, and teachers and school-children are deriving great benefits therefrom. In three of the principal schools hand and eye work received considerable attention.

Statement of Receipts and Expenditure for the Year ending 31st December, 1906, in respect of Special Classes conducted at Greymouth.

Receipts.	£	s.	d.	Expenditure.	£	s.	d.
Balance at beginning of year	107	10	0	Material for class use	1	3	6
Capitation on special classes	7	17	6	Coach fares of teachers attending classes	11	6	0
Buildings	950	0	0	Contracts (new buildings, additions, &c.)	868	15	0
Special grant for instruction in agriculture	25	0	0	Architect, &c.	78	17	9
				Balance at end of year	130	5	3
	£1,090	7	6		£1,090	7	6

P. F. Daniel, Secretary.

WESTLAND.

Extract from the Report of the Education Board.

Manual and Technical Classes.—(1.) A teachers' instruction class in nature-study was held during the year. Two terms, each with a special course, were occupied under the tuition of Miss Olliver, M.A., B.Sc., and proved very profitable to the teachers, the average roll-number being 24. (2.) Two special evening classes—one in woodwork and one in commercial subjects—were held under the instruction of Mr. H. G. Wake, B.A., headmaster of the District High School. The roll-numbers were respectively 27 and 28, and the attendance and interest were fully maintained. (3.) Two woodwork classes in connection with the Hokitika District High School and the Kumara School were continued during the year. (4.) Six school classes in handwork were in force in the larger schools, and in three schools under a male sole teacher capitation was received by extra instructors in needlework. In addition, handwork was included in the course of instruction in the junior classes of a number of other schools. The supply of the necessary apparatus for the science room of the Technical School has been completed, and, although the attempt to form an evening class in chemistry failed, the room is expected to prove of service during the present year in connection with special classes, including one for teachers. Owing to the failure, in conjunction with the Grey Board, to obtain a qualified teacher for cooking classes, none have been held during the year. At present arrangements are in train by which this useful branch of education will receive full attention in the immediate future. The Board has made arrangements, in conjunction with the Nelson, Marlborough, and Grey Education Boards, by which an instructor in agriculture will during the present year visit the district and establish instruction in this subject on a satisfactory basis.

Extract from the Report of the Inspector of Schools.

Hokitika School Woodwork Class.—The woodwork class is attended by the older boys, and is carried on under the charge of the headmaster, Mr. H. G. Wake, whose high qualifications and keen enthusiasm specially fit him for the work. The pupils receive very sound instruction, and the results of the year's course are highly satisfactory. These results are greatly enhanced by the exercises in instrumental drawing that are connected with the woodwork.

The receipts in connection with the class amounted to £31 12s. 8d., including a credit balance of £12 3s. 8d.; fees, £8 5s. 6d.; capitation, £9 10s. The expenditure was £20 13s. 8d. for instructor's salary, leaving a balance of £10 19s.

Kumara School Woodwork Class.—The woodwork class, under the management of the Kumara School Committee, and instructed by Mr. G. A. Bell, consists of 23 pupils, 15 of whom are on the roll of the Kumara School. All the pupils are engaged on the first year's course, although a few are in their second year of attendance. An explanation of this should be entered on the records, which should contain a periodical statement of the work done by the class. The receipts were £103 3s. 3d., including £15 7s. 8d. balance from last year and £87 9s. 7d. capitation. The expenditure was £97 3s. 1d., leaving a credit balance of £6 0s. 2d.

Special Woodwork Class.—This was an evening class held in the workshop attached to the Hokitika School, and carried on under the direction of Mr. H. G. Wake, headmaster of the school. The roll-number was 27, and satisfactory work was done during the term (June to November).

Receipts in connection with the class amounted to £54 4s. 6d., made up of £22 2s. 6d., grant for fittings; £21 1s., fees and fines; and £11 1s., capitation. The expenditure consisted of £27 9s. 2d. for fittings and £20 for instructor's salary, leaving a balance on operations for the year of £6 15s. 4d.

Special Commercial Class.—Special evening classes in commercial subjects were held from May to October, under the direction of Mr. H. G. Wake, B.A., headmaster of the Hokitika District High School. The roll-number was 28, and the attendance and interest were fully maintained.

Receipts in connection with the class, including capitation, fees, and grant for fittings, amounted to £30 18s.; and the expenditure (fittings and instructor's salary) to £16 16s., leaving a credit balance of £14 2s.

Statement of Receipts and Expenditure for the Year ending 31st December, 1906, in respect of Special Classes conducted at Hokitika.

Receipts.	£ s. d.	Expenditure.	£ s. d.
Capitation on special classes	12 14 9	Balance at beginning of year	19 12 4
Furniture, fittings, apparatus	28 18 6	Salaries of instructors	45 15 0
Fees	35 0 0	Office expenses (including salaries, stationery, &c.)	8 15 0
Special grant for training of teachers	75 0 0	Lighting and heating	1 5 8
Transfer from ordinary Building Fund for apparatus, special woodwork class	4 1 0	Examinations, &c.	4 5 0
		Fares of teachers	33 17 0
		Furniture, fittings, apparatus	32 19 6
		Balance at end of year	9 4 9
	£155 14 3		£155 14 3

A. J. MORTON, Secretary.

NORTH CANTERBURY.

EXTRACT FROM THE REPORT OF THE EDUCATION BOARD.

During the year 1906 several important developments took place in connection with manual and technical instruction. The appointment of Mr. J. H. Howell, B.A., B.Sc., as Director of the Christchurch technical classes, and the energetic action taken by the Board of Managers in the matters of the erection of suitable buildings and the formation of classes in a variety of subjects, have been followed by good results, the work now being on a sound footing and of much promise. The question of manual training (cookery and woodwork), discussed at some length in a valuable report submitted by the Inspectors, has received further attention. After carefully considering the Inspectors' report and the recommendations of Mr. Howell, who has been appointed to direct and supervise the work, the Board has felt justified in extending the scope of its school classes by arranging for the engagement of two thoroughly trained instructors in woodwork and one in cookery for the pupils of Standards VI and V. Under the supervision of its Director, and with the co-operation of the headmasters, the Board hopes to have the scheme in full working-order by the end of the present year. As indicated in last year's report, the Board has appointed an instructor in agriculture, in order to further the maintenance of classes in nature-study and practical agriculture, and to assist in the establishment of school gardens. Mr. G. Rennie was selected for the position from among several applicants, and the Board is well pleased with the zeal and energy he has brought to bear upon his duties. The Board is hopeful that the Department will renew the special grant made last year towards the cost of this new work, which can hardly fail to be of much benefit to the children attending the country schools.

EXTRACT FROM THE REPORT OF THE INSPECTORS OF SCHOOLS.

Manual Training.—In this necessary part of the school curriculum, which has attained such prominence in other countries and in other New Zealand centres, we hope to see a considerable advance during the forthcoming year. We refer more particularly to the work of the upper classes in woodwork, cookery, and cottage-gardening. It seemed so highly desirable that all pupils in Standards VI and V should receive training in one or other of these subjects when conditions render their introduction possible that the Board, in addition to an instructor in agriculture, has appointed Mr. J. H. Howell, Director of Technical Education in this city, to organize and direct the woodwork and cookery classes, and we have every confidence that under his able guidance the movement will make substantial and satisfactory progress. It is hoped that before the close of the present year there will be in operation a sufficient number of training centres to enable all pupils in the two upper classes of the city and suburban schools to receive instruction under such conditions as will minimise the necessary absence from the class-room.

EXTRACT FROM THE REPORT ON SPECIAL CLASSES AT KAIAPOI.

During the year ending the 31st December, 1906, classes were held for instruction in wood-carving, woodwork, dressmaking, and cookery. The attendance at the woodwork, wood-carving, and cookery classes was only moderate; that at the dressmaking class was good. Very satisfactory results are being obtained, especially in the school cookery and woodwork classes, the pupils of which take considerable interest in their work, and make good progress.

Statement of Receipts and Expenditure for the Year ending 31st December, 1906, in respect of Special Classes conducted at Kaiapoi.

Receipts.	£ s. d.	Expenditure.	£ s. d.
Balance at beginning of year	95 19 1	Salaries of instructors	90 9 0
Capitation on special classes	94 1 9	Advertising and printing	8 0 8
Rent	27 10 0	Rent	27 10 0
Fees	26 1 3	Material for class use	9 14 7
Sales	0 8 0	Petty cash	1 0 0
		Bank commission	0 5 0
		Honorarium, secretary	10 0 0
		Furniture, fittings, apparatus	7 19 6
		Balance at end of year	89 1 4
	£244 0 1		£244 0 1

H. C. LANE, Secretary.

EXTRACT FROM THE REPORT ON SPECIAL CLASSES AT LINCOLN.

The dressmaking classes were continued with marked success throughout the year. A new building for technical classes was built, the Department providing a grant for the purpose, and classes for woodwork were established during the year. Receipts: Capitation, £14 4s.; grants, buildings, £68 10s.; rent, £3; fees, £6: total, £91 14s. Expenditure: Salaries, £10; rent, £3; buildings, £68 10s; balance at end of year, £10 4s.: total, £91 14s.

Statement of Receipts and Expenditure for the Year ending 31st December, 1906, in respect of Special Classes conducted at Leeston and Doyleston.

Receipts.	£ s. d.	*Expenditure.*	£ s. d.
Balance at beginning of year	7 5 2	Salaries of instructors	78 7 6
Capitation on special classes	92 18 6	Office expenses (including salaries, stationery, &c.	0 4 0
Fees	12 0 0	Lighting and heating	1 9 9
Voluntary contributions	9 19 6	Material for class use	0 18 2
Prizes	2 10 6	Fees refunded	1 5 0
Sundry receipts	1 5 11	Bank fee and cheque-book	0 12 0
Balance at end of year	6 18 6	Sundries	0 6 0
		Outstanding at end of year	49 15 8
	£132 18 1		£132 18 1

H. C. LANE, Secretary.

Statement of Receipts and Expenditure for the Year ending 31st December, 1906, in respect of Special Classes conducted at Southbridge.

Receipts.	£ s. d.	*Expenditure.*	£ s. d.
Balance at beginning of year	52 13 3	Salaries of instructors	38 0 6
Capitation on special classes	28 1 0	Advertising and printing	0 10 0
Fees	5 2 6	Rent	1 0 0
		Bank commission	0 5 0
		Caretaker	4 18 0
		Balance at end of year	41 3 3
	£85 16 9		£85 16 9

H. C. LANE, Secretary.

EXTRACT FROM THE REPORT OF THE DIRECTORS OF THE CHRISTCHURCH ASSOCIATED CLASSES.

At the end of 1905 these classes were placed on a new basis, and the control, which had been temporarily assumed by the North Canterbury Board of Education on the resignation of the former managers, was handed over to managers elected by the contributing bodies. These, with their donations, were as follows: North Canterbury Education Board, the site for the new buildings, valued at £1,500; Christchurch City Council, £300; Selwyn County Council, £50; Agricultural and Pastoral Association, £20; Woolston Borough Council, £12 10s.; Chamber of Commerce, £10 10s.; Drainage Board, £10; Riccarton Road Board, £10; Employers' Association, £10; Trades and Labour Council, £10; Industrial Association, £10; Sumner Borough Council, £10; New Brighton Borough Council, £5 5s.; School Committees' Association, £2 2s.; trades-unions, £20 13s.

The present Director was appointed at the end of January, and such reorganization of the work as the conditions allowed was carried out at the beginning of the second term. The work has been conducted throughout the year under the most serious disadvantages. It would be a sufficient matter for congratulation if, under the circumstances which have now existed for nearly four years, the classes had merely survived; the fact that they have been successful gives promise that, when the new buildings are available and are properly equipped, the system of technical education in Christchurch will play a very important part in the commercial and industrial life of the community. The theoretical classes have been held, as heretofore, in a hall partially divided into rooms by partitions. Since it has been generally possible to hear all that has been going on in four or five rooms at the same time, it is hardly necessary to say that the teaching has suffered, and methods have had to be adopted that would not, under more favourable conditions, have been used. Until June the practical classes were held in two workshops rented from the City Council, but as one of these was urgently required by the Council for its storage-cells, all the work—plumbing, carpentry and joinery, coachbuilding, cabinetmaking, and wool-classing—had to be carried on in one room about 40 ft. square, where the acid-fumes from the adjoining batteries were at times intolerable.

In the first term classes were held in the following subjects: Principles and practice of carpentry and joinery, plumbing, carriage-building, wool-classing, dress-cutting and tailor's cutting, English, shorthand, typewriting, commercial arithmetic, book-keeping, commercial correspondence, drawing, geometry, and practical mathematics. At the beginning of the second term the work was reorganized, and the following additional classes were started: Applied science for plumbers, quantity-surveying, building-construction, cabinetmaking, commercial geography, French, and German. With the exception of quantity-surveying and German, the attendance has been such as to justify the continuance of these classes. During the third term, owing to the extension of other branches of the work, the class in tailor's cutting was dropped, as it was not well attended and required much room. It will be revived as soon as space is available.

The number of holders of free places in each term was 88, 94, and 91 respectively; the number of paying students was 120, 261, and 192 respectively; and the number of individual entries was 441, 672, and 571 respectively.

As regards the nature of the work done, the great obstacle that has been met is the general absence of a good grounding upon which the purely technical instruction can be based. This is particularly true in the case of the older trade students, who in many cases have left school before reaching even the Sixth Standard, and have done little or nothing in the intervening years to train their minds. Students of this class are often very impatient of results, and frequently leave the work before they have obtained any real benefit. If this state of things is to be remedied, it seems desirable that a pupil who leaves the primary school and does not go on to a higher day-school should still be required to attend evening classes until a certain standard of attainment is reached. Such compulsory continuation education has been established with great success in many parts of Germany and Switzerland; but, however desirable, it is more than doubtful if the recognition in this colony of the industrial as well as civic necessity for a wider spread of education is sufficiently general to warrant the adoption of compulsory methods. Much more may yet be done, both to emphasize the importance and to extend the scope of continuation work, by a system of organized co-operation between the continuation and technical school authorities and the teachers of the primary schools. As soon as greater facilities are available it is hoped that something may be done in this direction in Christchurch. Such a system is at work with signal success in Halifax, Yorkshire, where in a town of 107,000 people 60 per cent. of the boys who leave the primary schools between the ages of thirteen and sixteen attend evening classes. In 1904–5 over 90 per cent. of these attended three evenings per week, and one-quarter of the whole number did not miss a single attendance. It will be long before we shall be able to establish such a record in any town of New Zealand. Before much can be done the co-operation of employers must be obtained. To require children from thirteen to sixteen years of age to work for three or four evenings in the week after a day spent in the factory or shop is, in general, to place an undue physical strain upon them; and, whilst the fittest not only survive but profit by the struggle, many must suffer. If some relief during the day were given to those attending night-classes the results would be ultimately beneficial to employers as well as to employees. If compulsory adjustment of the hours of labour accompanied compulsory continuation education the best results would be obtained.

During the past year the North Canterbury Board of Education has provided continuation classes in three centres, so that all pupils who have left the primary school without gaining certificates of proficiency are enabled to do so. The classes have not been well attended, but they afford the opportunity for free technical education to all those who for any reason have been unable to qualify for it during their primary-school period; and when the classes are better known they should be much valued by this large section of workers.

The new buildings, for which a grant of £7,306 has been made by the Government, were commenced in October last, and should be completed early in July. The classes will be transferred to these at the earliest possible opportunity.

Thanks are especially due to the Press of Christchurch for its ready and generous assistance.

W. Howell, Director.

Statement of Receipts and Expenditure for the Year ending 31st December, 1906, in respect of Associated Classes conducted at Christchurch.

Receipts.	£ s. d.	*Expenditure.*	£ s. d.
Balance at beginning of year	7 2 9	Salaries of instructors	952 11 6
Capitation on associated classes	245 8 3	Office expenses (including salaries, stationery, &c.)	365 2 0
Capitation on account of free places	213 18 9	Advertising and printing	59 17 2
Buildings	1,150 0 0	Lighting, heating, and cleaning	92 19 2
Rent	168 4 0	Rent	192 8 2
Furniture, fittings, apparatus	73 17 0	Material for class use	58 17 7
Material	43 3 8	Refund students' fees	1 6 0
Subsidies on voluntary contributions	481 10 0	Office-furniture	31 17 7
Fees	290 7 9	Contracts (new buildings, additions, &c.)	1,150 0 0
Voluntary contributions	555 11 0	Architect, &c.	48 13 10
Prize fund	4 4 0	Furniture, fittings, apparatus	72 10 0
Sales	0 4 11	Clerk of works	52 0 0
Refund to contractors	102 2 0	Sundries	10 11 0
		Balance at end of year	247 0 1
	£3,335 14 1		£3,335 14 1

T. Garrard, Treasurer.

Extract from the Report of the Managers of the Ashburton Associated Classes.

The past year has been marked by distinct progress in the work that has now been carried on for several years past. The old High School buildings were handed over to the Technical Classes Association about the middle of February, and these, though they are very far from suitable, enabled the Managers to start new classes in cookery, shorthand, typewriting, and book-keeping. The following shows the numbers attending the various classes in each term: Cookery, 29, 23; dressmaking, 18, 10; woodwork, 10, 9; shorthand, 23, 14, 8; book-keeping, 16, 7; typewriting, 15. Besides the above technical and continuation classes, five school woodwork and four school cookery classes were carried on very successfully, with average attendances of 106 and 86 respectively. A typewriting class was carried on during the first term with borrowed machines, but as no grant could be obtained from the Government for purchasing typewriters this class had to be discontinued at the end of the first term. At the request of the more enthusiastic students the shorthand class was carried on for a third term, and some of the students were able at the end of the year to write seventy, eighty, and a hundred words a minute, although they commenced only in March and had instruction for only two hours a week. Two classes in wool sorting and classing were started in September with an attendance of 24. The Managers were fortunate in securing an excellent instructor, and it was thought that a larger number would have attended from the surrounding farming district. The students made very good progress, and it is anticipated that next year the instruction will be taken advantage of by a larger number of students if a suitable room can be obtained for holding the classes.

The thanks of the Association are due to Messrs. Friedlander Bros., who generously gave the use of one of their grain-stores as a class-room.

The attendance at the evening classes fell off very materially during the second term, which commenced in midwinter, chiefly owing to the distance the school is from the centre of the town. Many, too, who would have attended a more centrally situated school did not enrol in either term from the same cause. With new and up-to-date buildings near the centre of the town the attendance at the classes would be very greatly increased.

The financial position of the Association is sound, the balance-sheet showing a credit of £149 1s. 11d. The thanks of the Association are due to the Ashburton County Council, Ashburton Borough Council, the A. and P. Association, the High School Board, the Borough and Hampstead School Committees, and private subscribers for very valuable financial assistance.

Statement of Receipts and Expenditure for the Year ending 31st December, 1906, in respect of Associated Classes conducted by the Ashburton Technical Classes Association.

Receipts.	£	s.	d.
Balance at beginning of year	48	12	0
Capitation on associated classes	146	19	6
Buildings	128	8	7
Rent	13	0	0
Furniture, fittings, apparatus	148	14	8
Material	3	17	8
Subsidies on voluntary contributions	21	8	0
Fees	81	10	11
Voluntary contributions	85	17	0
Sales of material, &c.	12	2	9
	£690	11	1

Expenditure.	£	s.	d.
Salaries of instructors	204	13	4
Office expenses (including salaries, stationery, &c.)	41	14	5
Advertising and printing	8	17	0
Lighting and heating	13	9	6
Insurance and repairs	10	4	0
Rent	8	13	8
Material for class use	36	7	3
Carrying and railage	3	6	5
Caretaker	13	0	0
Contracts (new buildings, additions, &c.)	117	1	7
Furniture, fittings, apparatus	84	2	0
Balance at end of year	149	1	11
	£690	11	1

HENRY DAVIS, Chairman
J. McLEOD, Secretary } of Managers.

EXTRACT FROM THE REPORT OF THE MANAGERS OF THE LYTTELTON ASSOCIATED CLASSES.

Good work continues to be done in respect of the school classes for instruction in woodwork and cookery. The attendance at the technical class for instruction in dress-cutting and dressmaking, which during the earlier part of 1905 had been well maintained, fell off at the end of that year, and it was found impossible to continue the class during 1906. There is, however, an indication that the class may be restarted again during the current year.

The pupils at the two school classes show considerable interest in their work, and it is evident that in each section excellent work is being done.

Statement of Receipts and Expenditure for the Year ending 31st December, 1906, in respect of Associated Classes conducted at Lyttelton by the Lyttelton Technical Classes Association.

Receipts.	£	s.	d.
Balance at beginning of year	27	7	8
Capitation on associated classes	31	13	0
Rent	40	0	0
Subsidies on voluntary contributions	10	0	0
Fees	7	15	6
Voluntary contributions	10	0	0
	£126	16	2

Expenditure.	£	s.	d.
Salaries of instructors	21	5	0
Office expenses (including salaries, stationery, &c.)	1	16	0
Advertising and printing	3	15	6
Lighting and heating	3	0	3
Rent	40	0	0
Material for class use	2	2	9
Cleaning	4	11	0
Balance at end of year	50	5	8
	£126	16	2

S. H. WEBB, Chairman
G. A. LEWIN, Hon. Secretary } of Managers.

EXTRACT FROM THE REPORT OF THE MANAGERS OF THE RANGIORA ASSOCIATED CLASSES.

The Managers report that the classes are being well attended. A class for shorthand and typewriting has been established during the past year, with Miss Williams as instructor, and the results have been most satisfactory. The dressmaking classes under Miss Gillies continue to do good work, there being an average attendance of over thirty pupils. The cookery classes under Miss Rennie are doing good practical work. The want of a more suitable building in which to carry on a more extended programme is very much felt.

Statement of Receipts and Expenditure for the Year ending 31st December, 1906, in respect of Associated Classes conducted by the Rangiora Technical Classes Association.

Receipts	£ s. d.	*Expenditure.*	£ s. d.
Balance at beginning of year	6 2 4	Salaries of instructors	85 0 0
Capitation on associated classes	70 6 9	Office expenses (including salaries, stationery, &c.)	0 10 0
Rent	4 0 0	Advertising and printing	3 17 6
Subsidies on voluntary contributions	20 0 0	Lighting and heating	3 1 0
Fees	51 16 3	Rent	4 0 0
Voluntary contributions	20 0 0	Material for class use	3 13 6
Balance at end of year	0 6 5	Board and lodging of instructors	13 10 0
		Caretaker	9 0 0
		Railage	0 7 9
		Bank charges and cheque-book	0 12 0
		Furniture, fittings, apparatus	49 0 0
	£172 11 9		£172 11 9

JAS. CARMICHAEL, Chairman } of Managers.
J. MARSHALL, Secretary }

EXTRACT FROM THE REPORT OF THE MANAGERS OF THE AKAROA ASSOCIATED CLASSES.

The Managers report that technical classes have been successfully established. In July last classes were opened as follows: Cookery, 42 pupils, Miss E. Wright; woodwork, 16 pupils, Mr. C. Newton; shorthand, 15 pupils, Miss G. Dawson; book-keeping, 19 pupils, Mr. C. W. Leete: total number of pupils, 92. During the term 16 pupils attended the cookery class, and 10 the shorthand class. Owing to the classes not commencing until so late in the year, it was not thought advisable to continue the woodwork and book-keeping during the second term. It is to be hoped an early start will be made this year, so that the classes may finish before the warm weather begins. In all the classes a keen interest was taken in the work by both teachers and pupils. During the year Mr. Isaac, Inspector of Technical Schools, paid a visit to Akaroa, and expressed himself as well satisfied with the progress made. The only fault he found was that the building used for the cookery and woodwork classes was unsuitable. We hope that this will be remedied this year, as Mr. E. E. Lelievre has offered a section of land to the Association on condition that the Education Department give a grant for a suitable building. The question of a class for wool-sorting was considered by the Managers, but, owing to the difficulty experienced in finding a suitable teacher, was postponed. The classes have about paid for themselves, so that there is still in hand the sum contributed locally (£84) and the Government subsidy on this sum.

Statement of Receipts and Expenditure for the Year ending 31st December, 1906, in respect of Associated Classes conducted by the Banks Peninsula Technical Classes Association.

Receipts.	£ s. d.	*Expenditure.*	£ s. d.
Material	111 14 10	Salaries of instructors	57 5 0
Subsidies on voluntary contributions	84 4 11	Office expenses (including salaries, stationery, &c.)	1 4 4
Fees	27 15 0	Advertising and printing	4 0 3
Voluntary contributions	84 4 11	Lighting and heating	3 0 0
Sales of material	12 13 5	Insurance and repairs	0 17 6
Fines	1 1 1	Rent	29 0 6
		Material for class use	17 0 4
		Cleaning	1 4 0
		Sundries	1 5 3
		Furniture, fittings, apparatus	115 9 4
		Balance at end of year	91 7 8
	£321 14 2		£321 14 2

J. D. BRUCE, Chairman } of Managers.
ALEX. GRAY, Secretary }

EXTRACT FROM THE REPORT OF THE MANAGERS OF THE SCHOOL OF DOMESTIC INSTRUCTION.

The reports of the work of the school in the past have been marked by a dull though not dismal monotony, the recognition of a considerable measure of success, and the expression of general satisfaction. Whilst both these notes have to be sounded again this year, there is the addition of a pleasant variant. At last the school is domiciled in a suitable and well-fitted building in a central position, where it may carry on its work for many years. Man's sole claim to distinction in the animal world is that he can cook. All other characteristics, it is now admitted, are shared in some degree by his less-developed relations; but in this, as in the exercise of most of his lately evolved abilities—and although he has delegated its practice to his more intuitive and less otherwise partner, woman—the use of his power is crude and partial. We confidently assert that the school is consciously stimulating the work of Nature in this direction, with the happy result of better-ordered stomachs and happier tempers, though it is not possible to uphold the assertion by statistics. The welfare of society, no less than that of an army, depends upon its kitchen. The larger building has entailed an expenditure on fittings and the "extras" which generally attend on furnishing beyond the grant made by the Education Department for that purpose, and, of course, entails an increased staff. Miss Middleton, who has rendered valuable service in the past, has now been placed upon the permanent staff, at a salary of £50 per annum; and two pupils, selected by the Principal from a probationers' class held during last term, have been appointed to assist, at a nominal salary, which we hope will be increased annually. They also receive a complete course of training, and will help to supply the great need which exists in various parts of the colony of trained cooks who are qualified to teach. The number of pupils attending the associated classes has been somewhat larger than last year, whilst of those pupils attending the primary schools there has been a large increase. The attendance at the various classes was as follows: School classes—St. Albans 79, Sydenham 47, West Christchurch 99, East Christchurch 89, Richmond 56, Waltham 60, Woolston 53, Fendalton 26, Addington 61, Normal School 51; associated classes—first term 160, second term 165, third term 143; teachers' class, 14: total number of pupils, 1,103.

The usual examination of pupils was held at the close of the year.

The examiner reports as follows: "The Committee is indeed to be congratulated upon having acquired such splendid up-to-date rooms, fitted with every convenience for practical work, and thoroughly well ventilated, which is always a most important item, but especially so when a number of gas-stoves are in use. The cooking was well done—one class being the best working-class yet held—quality of cooking, method and neatness of work, all proving the thoroughness of training received, the scullery part of the work being made much lighter by the number of sinks and good hot-water supply. A word of praise must be given to the school staff for the arrangement of tables, utensils, and all ingredients ready to hand for the practical class."

The usual examination in connection with the City and Guilds of London Institute was also held during the year. Four pupils from the school entered, and all passed.

THOMAS HUGHES, Chairman.

Statement of Income and Expenditure for the Year ending 31st December, 1906.

Receipts.	£ s. d.	*Expenditure.*	£ s. d.
Balance at 31st December, 1905	89 10 1	Salaries of instructors	376 8 10
Capitation on associated classes	104 12 6	Rent	147 15 0
Material for associated classes	124 5 8	Cooking-material	183 6 2
Rent	39 0 0	Furniture, fittings, and utensils	343 15 8
Furniture, fittings, and utensils	74 2 5	Advertising and printing	26 17 4
North Canterbury Board of Education—		Lighting and heating	40 2 2
Contributed for capitation on school classes	446 9 1	Petty cash	25 0 0
Contribution for furniture and fittings	197 6 0	General expenses	55 11 2
Fees	149 19 0	Bank charges and cheque-books	1 5 0
Sales	43 1 3	Balance at 31st December, 1906	68 4 8
	£1,268 6 0		£1,268 6 0

O'BRYEN HOARE, Hon. Treasurer.

EXTRACT FROM THE REPORT OF THE CHAIRMAN OF THE BOARD OF GOVERNORS OF CANTERBURY COLLEGE.

School of Art.

During the year 1906 the class entries numbered 1,009, against 887 for the previous year.

Drawing and painting: Instruction was given in drawing and painting from life, still life, landscape from nature, and drawing from the antique. The life classes were considerably extended, and classes for illustrative purposes and the study of historical and modern costumes added, making a total of seven life classes per week. The landscape classes were continued throughout the year; during unfavourable weather a life model was posed for the purpose of studying the figure in relation to landscape painting. Design: Lectures on the principles of ornament were delivered in the afternoon and evening, and also a series of lectures on the historic styles of ornament. The applied design classes followed the lectures on the principles of ornament, and so enabled students to apply these principles to their individual crafts. This section of the school's work made an enormous advance on the previous year, being attended by over fifty students. Artistic crafts: Instruction was given in wood and stone carving, repoussé, gesso, leather-work, and leaded light. Modelling: Some creditable elementary work has been done in this section. It is to be regretted that art students throughout New Zealand show so little interest in this important subject. Modelling is undoubtedly the finest means of learning form, without a knowledge of which success in any form of art is unattainable. Architecture and building-construction: A most complete course was arranged in this section, including geometry, perspective, elementary and advanced building-construction, quantity-surveying, design, historic ornament, history of architecture, specification-writing, and architectural design. A number of students took the complete course, extending over five evenings per week throughout the session. Some six students attended the day-course throughout the year, and did excellent work. Painters' and decorators' work: Classes in practical work were held twice a week, and instruction was given in writing, glass-embossing, graining and marbling, stencilling, and decorative painting. Most of the students attended the classes and lectures in design and principles of ornament. Carpentry and joinery: This class did excellent work in combination with the building-construction section. Many students carried out their drawings executed in the building-construction classes, making models of portions of buildings to scale, and thereby testing the stability of the construction. Cabinetmaking: The work of this class was chiefly drawing out full-sized details of cabinets, making small perspective sketches and original designs, and executing in material the more difficult problems of the trade. The bulk of the students of this section attended the design and modelling classes. Instruction to teachers and pupil-teachers: Classes for blackboard drawing were held on Tuesday afternoons for students from the Training College. Classes were also held on Saturday mornings for State school-teachers; instruction was given in freehand, model, blackboard, geometrical and perspective drawing, modelling, brush work, wood-carving, carton and repoussé work. These classes were attended by upwards of a hundred students, and some excellent results were obtained. Scholarships: Seven free studentships were awarded on the year's work to students of the day and evening classes; also some twenty-four scholarships to pupils of the State schools. Arts and Crafts Guild: An important feature of the year was the institution of the Guild of Arts and Crafts, the objects of the Guild being to assist in cultivating amongst art and craft students a friendly and social spirit. Meetings were held each month, at which lectures and demonstrations were given, followed by criticism of members' work. A great variety of subjects were treated, and many valuable criticisms given by well-known artists and craftsmen. As an outcome of the Guild's influence may be mentioned the scheme for the decoration of a "hall" now in the International Exhibition. This really fine piece of work was the combined effort of the design, painters and decorators, cabinetmaking, carpentry, wood-carving, and repoussé classes. These classes were brought together by the influence of the Guild to discuss the advisability of executing a combined piece of work, and the corner settle, with its collection of repoussé articles, and the wall scheme was the outcome. Mr. Sidney Thompson was appointed instructor in drawing and painting from life at the beginning of the year. Towards the end of the year it was decided by the Board to appoint an expert in metal-work, enamelling, and the relief crafts, with the result that Mr. F. G. Gurnsey, of London, was chosen for the position. It was also found necessary to make a change in the architectural department. Applications were invited for the position of lecturer in architecture and instructor in building-construction. Mr. H. L. White, late of Gloucester, was appointed. The usual examinations were held at the end of the year; certificates and prizes were granted to successful candidates. Thanks are due to Messrs. Gibb, W. Sey, A. H. Fielder, and Whitcombe and Tombs for special prizes for painting, decorators' work, architecture, and design.

R. Herdman-Smith, Director.

Statement of Receipts and Expenditure for the Year ending 31st December, 1906.

Receipts.	£ s. d.	Expenditure.	£ s. d.
Students' fees	707 3 0	Balance at 1st January, 1906	173 7 2
Government grant for technical classes	556 18 6	Salaries	1,200 11 11
Government grant for apparatus and material	43 14 2	Subsidies to life classes	49 0 0
Contribution from Museum, Library, and School of Technical Science Endowment	500 0 0	Insurance	4 7 0
Interest	0 2 4	Contribution towards expenses of Registrar's office	40 0 0
		Gas	56 4 6
		Repairs	9 17 6
		Advertising	46 10 5
		Printing, stationery, &c.	36 8 7
		Fuel	10 11 3
		General expenses	28 17 2
		Apparatus	30 3 11
		Examiners' fees	2 2 0
		Books for school library	9 3 7
		Expenses connected with appointment of Director	28 4 1
		Painting exterior of buildings and distempering rooms	35 13 4
		Material for painters' class	3 11 3
		Exhibit, New Zealand International Exhibition	9 17 10
		Balance	33 6 6
	£1,807 18 0		£1,807 18 0

School of Engineering.

As far as the school is concerned, the year has been notable for the number of satisfactory positions obtained by students, and the exceedingly good reports received from those for whom they are working. These positions number fifteen, and the salaries paid aggregate over £3,000. With the exception of two all are in the colony, a fact which should go far towards correcting the impression that there is no opening for the young engineer in New Zealand. The appointments obtained range from that of engineer and manager of one of the principal gasworks in the colony to those of draftsmen in the offices of local firms and public bodies, and also include those of resident and assistant engineers. A lecturer in electricity and electrical engineering was provided for the Thames School of Mines, a lecturer in electricity for the technical classes at Oamaru and Timaru, and an instructor in drawing for the Christchurch Technical Classes.

Attendance.—A hundred and sixty students attended lectures during the year, the hour attendances per week amounting to 1,231. Thirty-five students took the full courses for the University degree or for the associateship of the school, and seven College students attended lectures in electricity and magnetism. There was a slight falling-off in the total number of attendances as compared with the previous year, which is more than accounted for by—(1) The unusually large number of students who completed their courses at the end of 1905; (2) the competition of correspondence schools, and the establishment of technical schools in Christchurch and other centres (the existence of the latter renders it no longer necessary for lads from other towns to be apprenticed in Christchurch in order that they may obtain evening instruction in drawing and elementary applied science); (3) the fact that numerous apprentices were working overtime in connection with the Exhibition, and therefore unable to attend lectures; (4) the change in the University regulations, which now provide that a student must take a preliminary year in an affiliated college before entering the School of Engineering. The effect of this regulation has been to temporarily divert the supply of men taking a University course. There are, however, indications that a considerable influx of matriculated students may be shortly expected; whilst, if a system of scholarships is inaugurated by which the best students of local technical schools are enabled to pass on to a course of instruction here, these schools will become feeders to this establishment, and the number of advanced students be still further increased. By such a system of scholarships costly duplication in the higher work will be prevented, and the efficiency of technical instruction in the colony greatly improved.

Results of Examination.—At the University Examination in 1905, 6 students passed part of the first examination, and 9 completed the first examination; 7 passed part of the second examination, and 7 passed the final examination for the degree of Bachelor of Science in Engineering. Associateship of the School of Engineering: Four students passed the final examination for the Associateship in Mechanical Engineering of the School of Engineering and Electricity. The passes in the courses for the associateship in the subjects taught in the School of Engineering were—In freehand mechanical drawing, 4; advanced descriptive geometry, 2; steam-engine (elementary), 3; steam-engine (intermediate), 3; steam-engine (advanced), 3; applied mechanics, 5; mechanics of machinery, 5; hydraulics, 3; mechanical drawing (second year), 6; strength of materials (elementary), 4; strength of materials (intermediate), 4; strength of materials (advanced), 4; theory of workshop practice, 4; electrical engineering (intermediate), 1; electrical engineering (advanced), 1; surveying (elementary), 1; mechanical drawing and designing (final), 3. Associateship students taking subjects outside their regular course passed examinations and gained certificates as follows: 1 in locomotive and railway engineering, second-class certificate; 1 in electrical engineering (intermediate), second-class certificate; 1 in surveying (elementary), second-class certificate. Evening students: A hundred and four certificates were obtained by students attending evening lectures, who passed in the following subjects at the annual examination: First Class — Freehand mechanical drawing, 11; descriptive geometry and setting out work, 14; mechanical drawing, section I, 7; mechanical drawing, section II, 3; mechanical drawing, section III, 3; steam-engine (elementary), 10; elementary applied mechanics, 9; elementary strength of materials, 1; elementary electricity, 2; elementary electrical engineering, 1. Second Class—Freehand mechanical drawing, 4; descriptive geometry and setting out work, 3; mechanical drawing, section I, 6; mechanical drawing, section II, 5; mechanical drawing, section II (electrical), 2; mechanical drawing, section III (electrical), 1; steam-engine (elementary), 6; elementary applied mechanics, 5; elementary strength of materials, 1; theory of workshop practice, 1; elementary electricity, 9. Additional lectures: The following subjects were added to the syllabus of lectures: Building-construction, advanced surveying. Testing: Tests were carried out for the Government, local bodies, and private firms on steel plates, bridge-bolts, wire, hooks, cast steel, suction-gas plant, pumping plant, drainpipes, wire for power-pipe line, cement, bricks, sand, pumice and burnt-clay bricks, stone, and coal.

Apparatus.—The following new apparatus was added to the plant: A high-lift turbine pump, capable of delivering 300 gallons per minute against a head of 280 ft., directly driven by a 35-horse-power motor; a 12-horse-power experimental gas-engine, together with an experimental suction-gas plant; a Whipple temperature-indicator, and five Callender pyrometers for the measurement of high temperatures; furnaces and plant for heat-treatment of steel; a mercury pressure gauge and recorder; a boiler-pressure indicator; portable gear for the determination of brake horse-power; oxygen cylinder and fittings; a 2-horse-power motor and field rheostat; three voltmeters, five ammeters, a milli-volt and amperemeter, two wattmeters, current transformer, resistances, one galvanometer and fittings, a circuit-breaker, a digester switchboard, plug-board and fittings, inertia wheel, spring balances, laboratory tools, eighty lecture diagrams, and 120 lantern-slides.

Exhibit in Exhibition.—A comprehensive exhibit illustrating the work of the school was prepared and placed in the Exhibition.

ROBT. J. SCOTT, M.I.C.E., Professor in Charge.

Statement of Receipts and Expenditure for the Year ending 31st December, 1906.

Receipts.	£	s.	d.
Contribution from Museum, Library, and School of Technical Science Endowment Fund	800	0	0
Grants from Superior Education Reserves (College)	870	0	0
Students' fees	880	2	3
Students' fines	0	2	0
Government grant for technical instruction	341	12	0
Government grant for specialisation in engineering	2,000	0	0
Government grant for materials and apparatus	252	17	3
Testing-fees	79	5	6
Fees for certificates of associateship ..	3	3	0
Sale of slide-rules	7	4	0
Interest	4	6	5
Balance	260	17	9
	£5,499	10	2

Expenditure.	£	s.	d.
Balance, 1st January, 1906	41	6	0
Salaries	2,183	15	4
Instruction in surveying and civil engineering	170	15	6
Rent of building (College)	193	18	4
Exhibitions	20	0	0
Contribution towards expenses of Registrar's office	60	0	0
Gas and electric lighting	103	19	6
Insurance	37	19	0
Printing and stationery..	39	11	10
Advertising	20	9	0
Fuel (coal and gas)	14	0	9
Laboratory stores	17	17	9
Cleaning machinery	137	15	9
Experimental work and apparatus—			
Applied mechanics and mechanical engineering	158	4	10
Electrical engineering	106	17	2
Stores and chemicals	7	9	4
Upkeep of plant, repairs to machinery ..	58	2	9
General expenses	24	13	7
Building new Hydraulic Laboratory ..	1,356	3	9
Apparatus	688	16	8
Professor Scott, share of testing-fees ..	37	0	3
Exhibit, New Zealand International Exhibition	20	13	1
	£5,499	10	2

SOUTH CANTERBURY.

Extract from the Report of the Inspectors of Schools.

Some form of handwork is now practised in the majority of our schools; in the lower classes plasticine-modelling, brush drawing, paper-folding, and carton-work finding most favour, and in the upper classes cardboard-modelling and more advanced brushwork. The Board employs a specially qualified teacher of cookery for the training of the girls of the Fifth and Sixth Standards in the larger centres, and purposes appointing a second teacher to cope with the increased demand for such classes. An instructor in woodwork is also employed in conducting classes for the boys of the same standards. Classes for practical instruction in elementary agriculture are recognised in seven schools, part of the school grounds being laid out as gardens, in which experimental work is carried on.

Many of the teachers continue to display enthusiasm in the teaching of lessons that come under the head of nature-study. In this connection it may be remarked that the splendid attendance of teachers at the series of twelve lectures delivered at Timaru by the Principal and staff of the Lincoln College of Agriculture was specially gratifying to the Board. By arrangement the lectures were very fully reported in the *Timaru Herald*, and afterwards published in pamphlet form; and it is safe to say that a great deal of good must ultimately come from the fresh interest in agricultural science which the lectures aroused not only amongst the teachers for whom they were primarily intended, but also among the farmers of South Canterbury, many of whom found food for reflection and discussion in what the lecturers so clearly set before them.

Statement of Receipts and Expenditure for the Year ending 31st December, 1906, in respect of Special Classes for Teachers conducted at Timaru by the South Canterbury Education Board.

Receipts.	£ s. d.	*Expenditure.*	£ s. d.
Balance at beginning of year	75 12 5	Salaries of instructors	57 0 6
Capitation on special classes	64 18 10	Advertising and printing	12 14 6
Furniture, fittings, apparatus	6 6 0	Material for class use	14 5 1
Material	7 7 6	Furniture, fittings, apparatus	6 9 0
Grant for instruction in agriculture	75 0 0	Refund railway fares	16 13 1
Grant for the training of teachers	150 0 0	Other expenses not classified	9 17 5
Grant for railway fares	16 13 1	Balance at end of year	278 18 3
	£395 17 10		£395 17 10

A. Bell, Secretary.

Extract from the Report of the Managers of the Timaru Associated Classes.

During the year seventeen classes were conducted in various subjects by fourteen different teachers. In all there were 415 class entries, made up as follows: Electricity, 30; dressmaking (three classes), 61; engineering, 8; plumbing (two classes), 27; building-construction, 16; woodwork, 19; drawing, 14; wood-carving, 14; cookery, 13; shorthand, 35; book-keeping, 32; typewriting, 35; English, 55; arithmetic, 56. The average attendance for the whole term was 334. The session lasted for two terms of twelve weeks each, but the plumbing class was conducted for four terms, whilst engineering and electricity were only conducted for one term. It will be noticed from the above that the commercial classes have had the largest measure of support, while the technical classes in some instances have not been well attended. In the month of June Mr. E. C. Isaac, Technical Inspector, visited the school, and reported favourably on the classes and the school generally. The Managers also at different times appointed visiting committees, who paid periodical visits of inspection to the classes whilst at work. The technical classes were all conducted in the Technical School, Arthur Street, whilst the continuation classes were conducted in the rooms of the Main School. It is hardly necessary to point out that this arrangement (although the best that can be made at present) is not quite so satisfactory as having all the students under one roof; besides, the accommodation provided for school classes is hardly suitable for grown-up students; again, from hygienic reasons it is not desirable to use a room in the evening which has been crowded with children during the day. A pleasing feature of the year's work was the keen interest taken in the building-construction class by the South Canterbury Builders' Association. If employers of labour would only use their influence with their employees and try and get them to avail themselves of the opportunities offered at their technical schools we are sure that they themselves would feel the benefit in the increased efficiency of their workpeople. The day may not be far distant when legislation will make it compulsory for all apprentices to attend a technical school so-many nights per week; this actually is done in some parts of Europe. The Managers would like to see the technical side of the school more highly developed, and in this connection an attempt will be made this year to get additional rooms added to the Technical School building. A room is absolutely necessary for carrying on the electricity, engineering, and building-construction classes, as the only room available for those classes is the art room. No technical school is complete without a science room, and surely the largest town in South Canterbury, and a town of the size and importance of Timaru, is worthy of an up-to-date science room in its midst. Also, as the centre of an agricultural district such as this, agricultural chemistry should form one of the chief subjects of the curriculum.

The year's work must be considered highly satisfactory. The students as a body have been earnest, diligent, and well behaved. The results of the examination at the end of the term show that the students are doing good work. It is to be regretted, however, that more students do not avail themselves of the opportunities afforded of sitting for the South Kensington and City and Guilds of London Institute examinations.

The thanks of the Association are due to those local bodies and citizens who so willingly contributed to the funds of the Association, and thus enabled it to continue its existence; to the examiners, who conducted all their examinations gratuitously; to the teachers, who also may be said to work gratuitously, their remuneration being so small; to the Press for the ever-ready assistance it has always rendered in furthering the cause of technical education in our midst. The Managers also desire to place on record the prompt attention of the Central Department to all applications and claims made during the year.

R. GRANT, Director.

Statement of Receipts and Expenditure for the Year ending 31st December, 1906, in respect of Associated Classes conducted by the Timaru Technical Classes Association.

Receipts.	£ s. d.	*Expenditure.*	£ s. d.
Balance at beginning of year	152 5 4	Salaries of instructors	284 4 11
Capitation on associated classes	115 7 2	Office expenses (including salaries, stationery, &c.)	60 3 0
Capitation on account of free places	67 2 0	Advertising and printing	39 8 6
Buildings	200 0 0	Lighting and heating	5 2 7
Furniture, fittings, apparatus	29 6 7	Insurance and repairs	2 19 10
Material	4 11 0	Material for class use	34 18 6
Fees	152 18 0	Miscellaneous items	28 11 2
Voluntary contributions	79 16 0	Contracts (new buildings, additions, &c.)	222 11 8
Cash in savings-bank	3 9 6	Architect, &c.	11 3 0
Cash paid in beginning of year	3 12 6	Furniture, fittings, apparatus	52 15 10
Miscellaneous items	6 14 9	Balance at end of year	73 5 11
Interest	0 2 1		
	£815 4 11		£815 4 11

J. JACKSON, Chairman } of Managers.
RITCHINGS GRANT, Secretary }

EXTRACT FROM THE REPORT OF THE MANAGERS OF THE TEMUKA TECHNICAL CLASSES ASSOCIATION.

The year just ended, the fourth since the inauguration of the Association, has marked further advances in technical education in the district. In 1905 a grant of £1,000 for a Technical School and £435 for a secondary-class room was received from the Government and administered by the South Canterbury Board of Education, the two buildings being combined under one roof to plans prepared by the Board's architect. Grants for fittings and apparatus, as shown by the year's expenditure, were also received from the Government, and now at the end of 1906 Temuka possesses buildings for manual and technical instruction which in style and completeness of fitting are as up-to-date as any in the colony. Last year classes under the jurisdiction of the Temuka Technical Classes Association were carried on at Geraldine and Pleasant Point, but at the latter place the School Committee and others interested in the work felt that they could secure enough support to manage classes for themselves, and a Technical Association was started at Pleasant Point. At Geraldine, too, a meeting was held and a temporary committee appointed, but the committee will not take over control until next session, when the Association's apparatus already in that town will be handed over to them. Working under much more favourable circumstances, and with a staff of instructors all of whom had had experience in teaching the subjects they were handling, much better work was produced during the past session than in any previous session. New classes started were building-construction, practical chemistry, and blacksmithing, the first-mentioned being indifferently supported. Blacksmithing, however, was a most successful class, eighteen young farmers making regular attendances and rapid progress in the work. In a farming district such as this it should be the aim, if support is forthcoming, to provide similar classes of advantage to what is our principal industry. The dressmaking classes, of which there were four under improved instruction, did capital work, and cookery has fully maintained its high standard. The classes for relief carving and painting also did good work. The financial position of the Association is still sound. The thanks for this are due to the liberal support of public bodies. The year was begun with a credit balance of £115 16s. 8d., with several liabilities outstanding, and ends with a credit balance of £20 17s. 5d. No less than £825 7s. 8d. has been passed through the Association's books during the year, £381 16s. 6d. having been spent on apparatus, furniture, and fittings.

D. McCASKILL, Director.

Statement of Receipts and Expenditure for the Year ending 31st December, 1906, in respect of Associated Classes conducted by the Temuka Technical Classes Association.

Receipts.	£ s. d.	*Expenditure.*	£ s. d.
Balance at beginning of year	115 16 8	Salaries of instructors	138 8 0
Capitation on associated classes	142 15 9	Office expenses (including salaries, stationery, &c.)	53 6 1
Buildings	29 10 0	Advertising and printing	8 1 0
Rent	354 2 1	Lighting and heating	19 7 7
Furniture, fittings, apparatus	15 9 3	Insurance and repairs	72 16 9
Fees	36 10 6	Rent	29 0 0
Voluntary contributions	59 4 6	Material for class use	54 16 1
Grants from Education Board	24 19 4	Instructors' boarding-expenses	19 18 0
		Bank charges and cheques	1 1 6
		Travelling-expenses of instructors	4 3 6
		Other expenses	4 8 8
		Furniture, fittings, apparatus	352 3 6
		Balance at end of year	20 17 5
	£778 8 1		£778 8 1

G. W. ARMITAGE, Chairman } of Managers.
DONALD McCASKILL, Secretary }

EXTRACT FROM THE REPORT OF THE MANAGERS OF THE WAIMATE TECHNICAL CLASSES ASSOCIATION.

The Managers regret that on the whole the classes were not so well attended as they were the previous year. This, no doubt, was largely due to the fact that no personal canvas was made on behalf of the school. The woodwork classes had to be discontinued altogether, and the senior bookkeeping for the last quarter. Most of the other classes, however, were well supported. In previous years the dressmaking class has been very well attended; this year, however, the attendance was poor, and this was possibly due to the fact that a new system of dress-cutting was adopted, instead of the system which has been taught in previous years. The Managers are more convinced from this year's experience that these classes can only fully perform the function for which they were established by obtaining the sympathy and co-operation of all employers. They also feel that the liberality of the Government in the matter of these technical classes is not sufficiently widely known among the employers themselves, who may, by getting together a sufficient number of students, have classes established not only in purely educational subjects, but also in almost any branch of trade. They therefore hope that during the coming session both of these matters will be remedied.

G. PITCAITHLY, Director.

Statement of Receipts and Expenditure for the Year ending 31st December, 1906, in respect of Associated Classes conducted by the Waimate Technical Classes Association.

Receipts.	£	s.	d.	*Expenditure.*	£	s.	d.
Fees	16	17	6	Balance at beginning of year	16	14	10
Voluntary contributions	30	4	6	Salaries	128	16	0
Subsidy on voluntary contributions	20	4	6	Office expenses	7	15	9
Grant for apparatus	4	0	0	Advertising and printing	16	0	6
Capitation on classes	223	7	0	Lighting and heating	4	15	0
Charts sold	6	0	0	Insurance and repairs	4	18	5
Timber sold	0	10	6	Material for classes	5	0	5
				Furniture	1	12	0
				Charts	7	0	0
				Balance	108	11	1
	£301	4	0		£301	4	0

GEO. BARCLAY, Chairman } of Managers.
W. H. BECKETT, Secretary }

EXTRACT FROM THE REPORT OF THE MANAGERS OF THE PLEASANT POINT TECHNICAL CLASSES ASSOCIATION.

The Association started operations last year; classes were held for one session only. The attendance was so good that it was found necessary to start extra classes in dressmaking and wool-classing.

Commercial Class: This class met every Monday evening, and pursued a course in book-keeping, typewriting, shorthand, and actuarial arithmetic. Twenty-six students enrolled in this class, and the average attendance was 21. Wool-classing: Two classes for this subject were formed, one meeting on Monday afternoon and one on Friday afternoon. The classes were held in Mr. Halstead's wool-shed. Fourteen pupils joined the Wednesday class, and 10 pupils the Friday class. Dressmaking: Two classes for this subject were formed, one meeting on Tuesday evening and the other on Wednesday afternoon. The roll-numbers for the classes were 18 and 11 respectively. It is proposed to hold classes for the following subjects during the coming session: Cookery, dressmaking, wool-classing, English, commercial arithmetic, blacksmithing, and mechanical drawing. The services of excellent teachers have been engaged for the above subjects.

M. G. IRWIN, Director.

Statement of Receipts and Expenditure for the Year ending 31st December, 1906, in respect of Associated Classes conducted by the Pleasant Point Technical Classes Association.

Receipts.	£	s.	d.	*Expenditure.*	£	s.	d.
Subsidies on voluntary contributions	15	7	0	Salaries of instructors	40	0	4
Fees	25	12	6	Office expenses (including salaries, stationery, &c.)	5	5	6
Voluntary contributions	15	4	6	Advertising and printing	1	6	0
				Lighting and heating	2	6	6
				Material for class use	5	0	0
				Balance at end of year	2	5	8
	£56	4	0		£56	4	0

J. MAZE, Chairman } of Managers.
M. G. IRWIN, Secretary }

OTAGO.

EXTRACT FROM THE REPORT OF THE EDUCATION BOARD.

The number of schools taking handwork in accordance with the regulations for manual and technical instruction was 93, an increase of 27 for the year. In about twenty other schools instruction in one or more branches of handwork was given, but the time devoted to the instruction was not sufficient to qualify for capitation under the departmental regulations. The branches taken were paper-folding, paper-weaving, paper-designing, brick and stick laying, brushwork, carton, cardboard, plasticine, free-arm drawing, advanced needlework, physiology and first aid, swimming, botany, cookery, woodwork, agricultural chemistry, elementary agriculture, elementary physics, and physical measurements. During the December quarter, 1906, the number of pupils receiving instruction in handwork subjects was 11,449, or 60 per cent., being an increase over the previous year of 1,439 pupils, or 8 per cent. In recent years a large increase has taken place in the number of school gardens. In fifty-three schools elementary agriculture is a recognised class, the school-garden being an indispensable adjunct, and in a number of other schools it exists as a means of providing material for nature-study. In this connection the Board has been fortunate in securing the services of the Director of the Dunedin Botanical Gardens to deliver a course of lectures to those country teachers that have the class recognised in their schools. The facilities offered for attending these classes have been largely availed of, and in the future still further advance in this subject may be reasonably expected.

It is to be noted with regret that in but few instances is Arbor Day devoted to the purpose for which the holiday was instituted, and that the enthusiasm that marked its inauguration has not been sustained in our schools.

The Inspectors report steady progress and the achievement of much good work in elementary agriculture, a department of work that is proving of great value and great interest to country schools, bringing teacher and pupil into close personal touch, and establishing bonds of sympathy between the school and the home. Special teachers of needlework were employed in twenty-eight schools having an average attendance below forty-one, and taught by male teachers. As in former years, Saturday classes in drawing, elementary design, brushwork, cardboard, and clay-modelling were held at the Dunedin School of Art, and were well attended by country teachers and pupil-teachers. The following is a summary of the receipts and expenditure in connection with the Manual and Technical Classes (exclusive of the Dunedin, Oamaru, and Kaitangata classes) for the year: Expenditure—Maintenance (salaries, material, &c.), £2,254 5s. 10d.; fittings and apparatus, £293 4s. 4d.: total, £2,547 10s. 2d. Receipts—Capitation, £1,887 9s.; special grant for training of teachers, £220; fees, £275 7s. 10d.: total, £2,382 16s. 10d. Loss for year, £164 13s. 4d.

EXTRACT FROM THE REPORT OF THE INSPECTORS OF SCHOOLS.

Handwork is practised in a large proportion of our schools, but it is our experience that too much attention is paid to mere doing and too little to the manner of doing and the expression of what is done and what the doing teaches. In the accurate expression of accurate impressions lies the chief educational value of this as of other work.

In elementary agriculture teachers have been feeling their way, doing a large amount of good work, but generally giving prominence to the craft side and the production of good crops of flowers and vegetables, instead of to the training in habits of observation, experimentation, and inference that such work is designed to give; and what they set themselves to do most of them do well. It now remains to give less attention to craft and crop and more to observation, experiment, and orderly development of thought and expression. In gardening, observation best grows out of experiment, the experiment asking the question and the pupils watching for the answer. Here accurate quantitative measurements and their accurate record are of great value. It is precisely in this department of the work that occurs our most signal failure, the records often being so imperfect, ill written, and unmethodical as to be nearly valueless. In the majority of the schools insufficient attention is given to care of the tools, all of which should, after use, be cleaned and oiled, and neatly placed in the toolhouse. On the whole, however, steady progress is being made; teachers, pupils, and parents show great interest and enthusiasm in the work; and agricultural and horticultural societies have encouraged it by instituting competitions for school exhibits. At the Dunedin Horticultural Society's last show one of our schools succeeded in winning in an open competition the second prize for vegetables.

Statement of Receipts and Expenditure for the Year ending 31st December, 1906, in respect of Special Classes conducted at Dunedin by the Otago Education Board.

Receipts.	£ s. d.	*Expenditure.*	£ s. d.
Capitation on special classes	408 9 9	Balance at beginning of year	383 0 3
Fees	256 19 7	Salaries of instructors	905 14 0
Grant for training of teachers	220 0 0	Office expenses (including salaries, stationery, &c.)	22 8 0
Balance at end of year	512 6 11	Advertising and printing	31 12 10
		Lighting and heating	43 19 10
		Material for class use	11 1 4
	£1,397 16 3		£1,397 16 3

P. G. PRYDE, Secretary.

Statement of Receipts and Expenditure for the Year ending 31st December, 1906, in respect of Special Classes conducted at Kaitangata by the Otago Education Board.

Receipts.	£ s. d.	*Expenditure.*	£ s. d.
Balance at beginning of year	14 13 4	Salaries of instructors	19 18 0
Capitation on special classes	12 4 3	Office expenses (including salaries, stationery, &c.)	0 0 4
Fees	12 5 0	Lighting and heating	0 17 8
		Balance at end of year	18 6 7
	£39 2 7		£39 2 7

P. G. PRYDE, Secretary.

EXTRACT FROM THE REPORT OF THE MANAGERS OF THE DUNEDIN TECHNICAL CLASSES ASSOCIATION.

The Managers beg herewith to submit the eighteenth annual report. The Board of Management for the past year was composed of Messrs. A. Burt, D. R. Eunson, T. Mackenzie, M.H.R., and D. R. White, M.A., elected by the Otago Education Board; Messrs. J. F. Arnold, M.H.R., A. Sligo, and G. M. Thomson, F.L.S., reappointed by members of the Association; and Crs. T. Scott and J. H. Walker, representing the Dunedin City Council. Mr. Burt was re-elected Chairman and Mr. Eunson Hon. Treasurer.

Since the formation of the associated classes four years ago the constitution of this Committee of Management has remained practically unaltered, seven of the nine original Managers still retaining their seats. The representatives of the various associated bodies have always worked in perfect accord, while members of the Education Board have shown every sympathy with our efforts. The increased grants obtainable for schools working as "associated classes" have enabled us to obtain the much-needed and long-desired extension of our building.

A detailed account of the past year's work is given in the Director's report. The number of individual pupils enrolled during the year was 828.

Of the 61 classes in operation this year, 15 were for continuation subjects, 21 for commercial subjects, and 25 for technical subjects. A satisfactory feature of this division is the increased provision that is year by year being made for technical subjects and for working these in as parts of recognised courses.

The recent additions to the school provide us with a plumbers' workshop, a carpentry workshop, an engine and dynamo room, a cell-room, a large room for practical electrical work, a cookery room, a chemical laboratory, and three large class-rooms. Although the additional accommodation thus secured has relieved the congestion and overcrowding, still the rooms at our disposal are not sufficient for the courses of instruction. Adjoining our well-equipped and up-to-date plumbers' workshop we require a lecture-room for demonstration, experimental work, and theory generally, and our arrangements cannot be regarded as complete until this special room is provided. Next, in connection with our carpentry workshop, a room is required where instruction may be given in the necessary drawing, demonstration, and theory. Further, although our classes for mechanical engineering have always been self-supporting (forty-nine students last year attending the classes for this subject), yet we have neither special rooms nor suitable provision for giving instruction in this important branch, and in order to remedy the defect other two rooms are urgently required. Mr. Rodger (the Board's architect) is now busy preparing plans for the necessary rooms. This addition, it should be mentioned, will complete the building and leave no room for further extension on the present site. Until the suggested building can be erected it may be necessary to modify the furnishing and fittings of the electrical workshop, that it may during the next few months serve a double purpose.

With the object of meeting the anticipated demand for day technical classes, your Managers had a first year's scheme of work prepared, wherein provision was made for three separate courses. These were a thorough domestic course, a very full commercial course, and a first year's technical course, the science, drawing, and mathematics of the last-mentioned being such as would admit of subdivision and specialisation during the second year. Enrolments on behalf of intending pupils were invited, but the number of applications in reply thereto was insignificant. Seeing that the establishment of day classes would necessitate the employment of a permanent day staff, and involve considerable financial risk, your Committee did not deem it advisable to proceed further with the matter this year. The afternoon classes will, however, be still further extended, and in all likelihood the outcome will be the establishment next year of day classes somewhat on the lines indicated above.

That the classes of our Technical School are free to holders of proficiency certificates is a fact the Managers would like to be more generally known. The concession is granted for two years, regardless of age, and if the attendance and progress are satisfactory the period may be extended to five years. Further, it is understood that pupils not entitled to free places, and whose circumstances are such that they cannot well afford to pay fees, will, on giving the necessary information, be granted remission of fees.

Another fact that the Managers wish to direct attention to is the liberality of the University professors, who grant free tuition to our leading scholars in English, physics, and chemistry. This concession has been an incentive to many of the students, several of those taking advantage of the tuition thus gained having afterwards distinguished themselves.

The balance on the credit side is £101 4s. 1d. Since the end of the financial year, however, the allowances for the last quarter have come to hand.

We again tender thanks to the hon. examiners for their services so freely rendered, and also to the Press for its ever-ready assistance. And once again the Managers desire to express appreciation of the services of the Director and the teaching staff. Much credit is due to them for the honourable position that the school has now attained, as well as for the excellent work done during the past year.

ALEX. SLIGO, Acting-Chairman.
ANGUS MARSHALL, Secretary.

EXTRACT FROM THE REPORT OF THE DIRECTOR OF THE DUNEDIN TECHNICAL SCHOOL.

I beg to submit the following report of the work done during the session now closed. Building operations delayed the opening of the classes for three weeks, and, owing to the removal of the back portion of the building, the accommodation at our disposal was more inadequate than ever; consequently, several classes, of which the most important was that for instruction in practical electrical work, could not be held. For the first time for many years past operations were confined to Dunedin, where 61 classes were carried on. Of these classes 15 were for continuation subjects, 21 for commercial subjects, and 25 for technical subjects, the number of technical classes thus again showing an increase. Altogether 828 individual pupils enrolled.

In accordance with the regulations for manual and technical instruction free places were granted to 229 pupils. Of these, 9 did not even enter on their course, 5 attended only a few times, and 4 others failed to attend the minimum number of times required to qualify for continuance of the privilege. But, with regard to the 211 holders that did qualify, I am pleased to be able to state that the improvement noted last year was much more pronounced during the year just ended. Indeed, the work of these students was consistently marked by energy, industry, and ability, and is certainly worthy of commendation. The means of instruction provided by the Association for students of this class alone may now be regarded as one of the leading features of our work, and a sufficient recompense to the public for the support so liberally accorded our institution in the past.

By subdivision of the larger classes a good working classification of the pupils has now been obtained. Special divisions were formed for those entering at mid-session, and altogether the arrangement worked most satisfactorily. The examiners express appreciation of the efforts made to maintain the standard of the work, and the Association is fortunate in having as instructors of these classes six headmasters and several assistants from the public schools.

Commercial correspondence and office routine was attended by 73 students, book-keeping by 94, typewriting by 119, shorthand by 123, and commercial arithmetic by 319. The class for commercial law was this year allowed to lapse. Many of the pupils attending these classes are engaged in commercial work during the day, and are endeavouring to become more proficient and hence better qualified for promotion. And more particularly in commercial work does increased efficiency obtain immediate recognition. Doubtless this is one of the reasons of the popularity of these classes. On the other hand many young people, before seeking office employment, attend our commercial classes for the purpose of qualifying and of obtaining certificates that will be of service to them in obtaining their first situations. Our examiners, therefore, exercise great care, and the standard of pass demanded is undoubtedly high. Consequently the Association's certificate for such subjects, say, as speed shorthand and book-keeping are regarded by commercial men as strong recommendations. The stringency of the examination tests, it should be added, partly accounts for the relatively short pass list. A fair proportion of the students of this section seem to be deficient in ability or application, and it of necessity follows that they make little progress. Against this is set the fact that the teachers of this branch of the work are active practical commercial men of acknowledged ability, who seem to find pleasure in serving the Association. With the introduction of the new furniture, of which the purchase is now authorised, our provision for training in commercial subjects will be complete.

The students of the physics class, influenced, doubtless, by the enthusiasm of their teacher, were all earnest workers. The change of quarters, through the removal of the old laboratory and the dearth of suitable appliances, led to a reduction in the amount of experimental demonstration and individual practical work. The defects referred to are now, of course, in a fair way to be remedied. To suit the convenience of pharmacy students a class in chemistry was held on Wednesday afternoons, but towards the end of the session the attendance thereat fell away, and the class was closed. Although, unfortunately, the alterations in building necessitated the curtailment of the practical work, the evening class for the same subject was, as hitherto, a large and thoroughly successful one. An afternoon class for botany attracted only eight students, and one advantage of the smallness of the class was the opportunity for individual teaching which was afforded. Under these circumstances, and also owing to the removal of the teacher from Dunedin, the formation of the usual botany class was not attempted. During the second quarter, however, the two classes for horticulture were held, and although one of these was beyond the size recognised as suitable for efficient teaching, good and enjoyable work was done. Lectures and demonstrations were taken at the school in the evenings, and further demonstration and exemplification at the Botanical Gardens on Saturday afternoons. The students who attend for painter's work are fortunate in that their numbers permit of each getting a good deal of individual attention from the teacher. This year the principles and practice in graining and sign-writing was the ground covered. Eight panels, done by students in their first session, were sent forward to the Exhibition. Our class for tailor's cutting and fitting offers facilities that cannot be overestimated by those in the trade desirous of learning this branch. The course being a three-year one, a new class is formed only every third year, and students who show no special aptitude quickly drop out. One of the causes of weakness is neglect of a preliminary course in freehand drawing. The class for practical mathematics, originally formed in the interests of our students of mechanical engineering, electrical engineering, carpentry, and plumbing, is now a recognised part of the course for some of these branches. The value of training given has been affected by the frequent changes of teachers of the subject. The present teacher hopes to remain with us for some years, and I therefore anticipate more beneficial work. Plumbing was again well attended, and students of the subject having in former years evinced a tendency to shirk the drawing and calculation of the theory class, the course was this year so arranged that pupils of the practical class were compelled to attend for instruction in theory. For mechanical engineering a sufficient number of students attended to form two good classes, and here, also, the position was forced, the students who had not previously done so being compelled to attend for instruction in practical mathematics. If arrangements could be made with the Education Board it would be well to extend the compulsion to the mechanical drawing and machine-construction required for this subject. I am at a loss to account for the neglect of the carpentry class by apprentices of the trade. The room is up to date and well equipped, while the ability of the teacher is recognised. Yet an average of some seven or eight pupils is all that such a class commands. The wood-carving classes were increased to three, with the result that the discipline was much better, and students were able to get more of the teacher's time and attention than formerly. Some really good carving done in the class was sent to the Education Court at the Exhibition. The dressmaking classes are still well supported. Evidently the instruction given is popular, and "Fr'isco" system has now proved itself well suited for the requirements of such classes. A varied asortment of articles made by members of the class has been sent to the Exhibition. Owing probably to the opportunities schoolgirls now have of learning cookery, our classes are not so much sought after as they were a few years ago. Nevertheless, from the results of the practical examinations, it will be seen that there is no diminution in the quality of the work.

Last year, in referring to the holders of free places, I wrote, "Each of these pupils attends for instruction in four subjects on the average, and compliance with the regulations thus involves their spending eight hours per week of their evenings in the school. Upon those regularly engaged during the day this may be regarded as somewhat exacting and rather a strain, but it is nevertheless a good training in persistency of application. It seems to me, however, that the proper solution of the difficulty is to gradually extend the scope of our work by the establishment of day-classes, and so give the younger pupils the benefit of, say, two years' training before they enter employment." Therefore, in pursuance of this, in addition to those for cookery and dressmaking, classes were undertaken in wood-carving, English, commercial arithmetic, shorthand, and typewriting. The establishment of these classes somewhat relieved the congestion of our evening classes, and revealed the fact that there were at least forty young people prepared to take advantage of day-classes should provision be made for such. Further, since the opening of our session, the regulations have been altered so as to permit of any subject in the commercial course being taken during the day.

As in former years, I have to emphasize the care and trouble taken by the outside examiners in arriving at a just estimate of the work. The thanks of the Association are due to these ladies and gentlemen, and also to the three University professors, by whose liberality the leading students in English, chemistry, and physics respectively are granted free tuition in these classes at the University. This year Professor Gilray's prize is gained by Arthur H. Robinson, Dr. Shand's by Arthur J. Gibb, and Dr. Black's by Henry Lovell.

On the whole, the order and behaviour of the students may be regarded as satisfactory—indeed, if the members of two or three of the classes be excepted, the general conduct and attention of the others may be put down as exceedingly good. One feature of the attendance to which my attention has been directed is the relatively small number of pupils coming from within the city proper. The majority come from the distant suburbs, and by rail from as far as Mosgiel on the one side and Port Chalmers on the other.

A. Marshall, Director.

Statement of Receipts and Expenditure for the Year ending 31st December, 1906, in respect of Associated Classes conducted by the Dunedin Technical Classes Association.

Receipts.	£ s. d.	Expenditure.	£ s. d.
Balance at beginning of year	11 6 5	Salaries of instructors	1,074 17 0
Capitation on associated classes	553 10 8	Office expenses (including salaries, stationery, &c.)	183 0 2
Capitation on account of free places	306 19 0	Advertising and printing	71 16 3
Buildings	3,500 0 0	Lighting and heating	52 14 3
Rent	4 15 0	Insurance and repairs	54 2 1
Janitor (Education Board)	19 10 0	Rent	3 0 0
Material	47 18 0	Material for class use	105 8 0
Subsidies on voluntary contributions	220 3 6	Water-rates	8 2 0
Fees	397 3 6	Contracts (new buildings, additions, &c.)	3,369 7 6
Voluntary contributions	280 1 6	Architect, &c.	50 0 0
		Furniture, fittings, apparatus	115 3 3
		Contractor's deposit returned	152 13 0
		Balance at end of year	101 4 1
	£5,341 7 7		£5,341 7 7

Alex. Sligo, Acting-Chairman } of Managers.
Angus Marshall, Secretary }

Extract from the Report on the School of Art and Design.

During the period over which this report extends—viz., from the 5th February to the 22nd December—the total number of students who received instruction was 472. This number includes 180 teachers and pupil-teachers, 78 students of the Training College, 67 students who attended the day classes, and 147 students who attended the evening classes. The school was open daily from 9.30 a.m. to 4 p.m., and from 5.45 to 9 p.m., and on Saturday from 9.30 a.m. to 12 noon. The usual classes for elementary and advanced freehand and model drawing, and for light and shade were held throughout the year. The work comprised outline-drawing from models, familiar objects, and ornament from the cast, light and shade of ornament from the cast, from the antique, and from life. The course of work in painting was very similar to that of last year, and consisted of brushwork, painting in monochrome from the cast, colour studies from groups of still life, painting flowers from nature, painting from life, and landscape painting from nature once a week when the weather proved favourable. As regards modelling, the junior students worked from simple casts of ornament, while the more advanced worked from the antique, from life, and from original designs. Students of the Training College received special instruction in brushwork, blackboard drawing, and modelling in cardboard and in clay. Classes were held as usual on Saturday mornings, and were largely attended by country teachers and pupil-teachers. The work of the teachers comprised a great deal of outline-drawing from models, light and shade from the cast, brushwork and modelling from simple casts and from nature. They worked conscientiously, and seemed anxious to make the most of their time.

The number of students who passed the South Kensington Science and Art Examinations was as follows: Freehand drawing in outline, 26; perspective, 4; drawing in light and shade, 3; painting from still life, 6; anatomy, 2; drawing from the antique, 2; building-construction, 11; model-drawing, 19; geometrical drawing, 5; memory drawing of plant-form, 6; drawing from life, 2; architectural design, 2; design, 3; machine construction and drawing, 8; blackboard drawing, 5.

Ten works were accepted for the Art Class Teachers' Certificate—viz., geometrical problems, 3; group of models (shaded), 3; light and shade from the cast, 2; plant-form from nature, 2 Three works were accepted for the Art Masters' Certificate—viz., shaded drawing from the antique, 2; and perspective problems, 1. The annual exhibition of students' work was held at the end of January, and was largely attended.

N. L. D. Hutton.

Extract from the Report of the Managers of the Oamaru Technical Classes Association.

The Managers, in submitting their report for the year 1906, have to report that the classes have been successfully carried on during the past year. The number of students enrolled was 485, and the number of classes 36. During the coming year it is expected that many of those who obtained proficiency certificates in the past, and who have not gone to a secondary school, will embrace the opportunity offered by the technical classes. Mention should be made of the success attained by the country dressmaking classes. A class in book-keeping was formed at Maheno, and was well attended. At the close of the year an exhibition of work was held in order that the public might have an opportunity of viewing some of the work. The Managers hope to make this an annual function, thereby increasing the interest and support, and in this connection they are gratified with the pecuniary encouragement received from local bodies and the general public. Thanks are due to the various examiners, to the Middle School Committee for the use of rooms, to the Superintendent for the large amount of work he has done during the year, to Mr. J. M. Forrester for his work in connection with the carpentry classes, to the Press for its support and assistance, and to the friends of the Association in the country who assisted in forming and supported the country classes. Mr. H. F. S. King, who held office as Secretary since January, 1906, resigned at the end of the year, and has been succeeded by Mr. A. A. McKinnon. It is confidently expected that the classes, or at least the majority, will be held in the old Customhouse building, Tyne Street, this year. Plans for the proposed additions and alterations have been submitted to the Department for approval. On the return of plans tenders will at once be called. From the balance-sheet submitted, embracing the period ending the 12th February, 1907, the receipts from all sources, including balance brought forward, amounted to £866 10s., and the expenditure to £865 16s. 7d., leaving a credit balance of 13s. 5d. to be carried forward.

Statement of Receipts and Expenditure for the Year ending 31st December, 1906, in respect of Associated Classes conducted by the Oamaru Technical Classes Association.

Receipts.	£	s.	d.	Expenditure.	£	s.	d.
Balance at beginning of year	24	0	11	Salaries of instructors	400	15	1
Capitation on associated classes	106	8	9	Office expenses (including salaries, stationery, &c.)	27	10	8
Capitation on account of free places	32	5	1	Advertising and printing	32	13	0
Furniture, fittings, apparatus	116	10	11	Lighting and heating	16	14	5
Subsidies on voluntary contributions	81	1	0	Insurance	1	14	9
Fees	246	18	6	Rent	22	0	0
Voluntary contributions	80	7	0	Fees returned	2	8	0
Sundry receipts	4	12	6	Cleaning	12	2	0
				Bank charges, &c.	1	0	0
				Postage, cartage, &c.	8	12	6
				Sundries	1	4	6
				Furniture, fittings, apparatus, and material	153	0	8
				Balance at end of year	12	9	1
	£692	4	8		£692	4	8

T. Williamson, Chairman } of Managers.
H. King, Secretary }

SOUTHLAND.

Extract from the Report of the Inspectors of Schools.

It affords us much pleasure to testify to the admirable work that is being done at the woodwork and cookery classes in connection with the schools in Invercargill and Gore. The display of woodwork from the former classes at Christchurch Exhibition was of high merit, and compared most favourably with similar exhibits from other districts with greater experience in the working of such classes. It is a matter of regret that the continuation classes, from which such good results were reasonably expected and the need for which is acknowledged by all authorities, have almost lapsed. The Saturday classes for the study of physical measurements (Mr. Stuckey) and agriculture (Mr. McIndoe) for certificated teachers, as also the classes for the study of drawing (Mr. Brookesmith) and physical drill (Mr. Hanna) for uncertificated teachers and pupil-teachers, were well attended and were beneficial in their operation. Especially was this the case with the classes in drawing, a subject which has for three or four years been a bugbear to prospective candidates for the D certificate. This year the results of the difficult examination in drawing disclosed very decided improvement.

EXTRACT FROM THE REPORT OF THE DIRECTOR OF TECHNICAL INSTRUCTION.

The year just closed has, from every point of view, been the most successful yet experienced in regard to the important work of technical education. In every department there has been an increase in the number of students under instruction, and the results achieved cannot fail to have been proportionately beneficial.

Technical and Continuation Classes.—(*a.*) Invercargill Classes: The numbers enrolled in the twenty-six classes were 519 and 489 in the first and second terms respectively, as against 423 and 397 for the corresponding terms of 1905. The standard of the work accomplished was, on the whole, satisfactory. The students evinced an evident desire to gain all the information possible, and that benefit was derived in many instances has been freely stated. On the other hand, dissatisfaction has also been found to exist, but wherever this was discovered every reasonable effort was made to remove the cause or causes of complaint. At considerable cost the plumbing-room was fully equipped with the necessary appliances to enable every branch of sanitary science to be studied, but while students were willing enough to attend the practical class it was found difficult to get them interested in the theoretical part of their trade. This difficulty will doubtless vanish in time as soon as it is understood that no student in plumbing can obtain a certificate of competency entitling him to be registered as a competent workman unless he has a thorough theoretical as well as a practical knowledge of the principles underlying his profession. The building-construction class was well attended, as were also all the other technical classes. The continuation classes were almost wholly attended by free pupils, ninety-six having availed themselves of the regulations for free places at technical schools. The new Technical School building was completed during the year, and as the work is now centralised the supervision of the classes is much easier than in former years.

(*b.*) Continuation Classes at Other Centres: Continuation classes were held at only four country centres—viz., Hedgehope, Koromiko, Limehills, and Wendonside. The subjects taught were chiefly those of Standards V and VI, along with book-keeping. A vocal music class was conducted at Hedgehope. A splendid site for a Technical School has been secured at Gore, a part of the police reserve near the centre of the town having been set aside by the Government for this purpose. A movement is on foot to establish vigorous classes at this important centre, and in the year to come it is expected that something practical will be accomplished in securing a grant for the erection of Technical School buildings. Bluff and Mataura are also showing signs of life, and technical classes will most probably be commenced at these centres during the coming year.

School Classes: Taking into consideration the population of the City of Invercargill and of Southland, the returns presented with this report show that this district is keeping fairly abreast of the newer methods of education. As the years pass there is borne in upon one the conviction begotten of experience that hand and eye work in the schools has supplied a need that existed in the child-nature. We ourselves remember as children at school the delight experienced in showing our companions at the desk the marvels that could be produced in paper of hats, boats, &c., and of the marvellous works of art that could be manufactured of putty (purloined in some cases wherever available), when we were supposed to be engaged in less frivolous tasks; and, although we knew that, if discovered, it would mean a few "palmies" and temporary disgrace, the enjoyment of our secret communications was nevertheless intensely keen and real. Nowadays, however, the child is encouraged and trained to do, as an important factor in the all-round development of his nature, the very things that a few years ago were regarded as a waste of precious time. And the result is distinctly beneficial. In the schools of this district hand and eye training is being gradually systematized, and an endeavour is being made to raise the quality of the work to a still higher level than formerly. Nineteen of the larger schools of the district have taken up the study of elementary physical measurements, and ten more the study of elementary agriculture, as part of their school course. Good results are expected to follow from these classes in the near future. A special grant of 10s. per pupil in attendance at these classes, with a maximum grant of £7 10s. for any one class, is obtained from the Department to equip the school with the necessary appliances. During the current year it is expected that many more of the country schools will take up the elementary agriculture course. The cookery and woodwork classes have been conducted under the most favourable conditions. It was a splendid advance when a permanent instructor was placed in charge of the woodwork department. In both these sections excellent work has been accomplished, and the Board is fortunate in having in its service instructors of such proved ability and of such whole-hearted enthusiasm in their work. I hope during the year to perfect a scheme whereby the benefits of the woodwork and cookery classes may be extended to other centres than Invercargill, and shall submit my proposals to the Board in due course. Advanced needlework classes were conducted in nineteen schools, first-aid classes were carried on at Lumsden and Rimu, and a swimming class was held in connection with Invercargill South School. As in former years, standard needlework was taught in most of the schools staffed by males only. The sum of £198 19s. 7d. was received as capitation on account of these classes, and was distributed to the sewing teachers as salary.

Teachers' training classes were held in Invercargill and Gore, the subjects of instruction being elementary physical measurements, elementary agriculture, and freehand, model, and blackboard drawing. The instructors were Messrs. H. O. Stuckey, M.A., B.Sc.; G. D. McIndoe, M.S.C.I.; and F. Brookesmith, A.S.A. The attendance of the teachers at these classes was on the whole good, though it was somewhat difficult to make the younger members of the profession understand that when the Department grants them a free pass to attend recognised classes it is their privilege and duty to take the fullest advantage of the opportunities offered. The instruction given in these classes has been of great benefit to the teachers and through them to their pupils. It also gives me pleasure to say that the quality of the drawings executed by the younger teachers has wonderfully improved during the year.

The duties connected with the administration of this Department have been rendered very pleasant through the uniform forbearance and courtesy of all concerned. I have again to record my thanks to all connected with educational matters in this office and district, and at Wellington, for kindly assistance given in many ways during the past year.

Balance-sheet for the Year ending 31st December, 1906.

Receipts.	£	s.	d.
Central Account—			
Students' fees	131	17	6
Capitation, special, and continuation classes	157	6	0
Grant for material	12	8	0
Donations (door at Exhibition)	3	0	0
Country Continuation Account—			
Capitation earned	18	12	4
School and Technical Account—			
Capitation earned	290	17	6
Material refund	51	9	6
Grant for rent	32	10	0
Grant for apparatus	312	15	0
Donations, Prize Fund	2	19	0
School Standard Account—			
Capitation earned	538	5	3
Needlework capitation	198	19	7
Teachers' Training Account—			
Government grant	325	0	0
Refund for material	5	3	9
Donations	20	7	6
Building Account—			
Government grant	2,743	0	0
	£4,844	10	11

Expenditure.	£	s.	d.
Balance from year 1905	106	5	2
Central Account—			
Salaries	323	1	6
Material and apparatus	9	0	3
Advertising and printing	22	10	6
Janitor and lighting	22	9	8
Furniture and fittings	33	5	6
Rent of section	5	0	0
Administration	25	0	0
Country Continuation Account—			
Salaries paid to teachers	18	12	5
School and Technical Account—			
Salaries	323	5	7
Material	96	5	0
Apparatus	43	0	2
Furniture and fittings	18	1	8
Rent (Gore)	24	7	6
Conveyance of children	21	15	8
Prizes	3	3	9
Janitor	4	17	0
Administration	25	0	0
School Standard Account—			
Material	99	5	7
Needlework salaries	198	19	7
Furniture and fittings	6	10	0
Administration	28	10	0
Teachers' Training Account—			
Salaries and expenses	109	3	1
Material and apparatus	17	3	6
Janitor	4	5	6
Building Account—			
Main building	2,712	10	11
Furniture and fittings	48	9	5
Balance	494	12	0
	£4,844	10	11

W. A. McCaw, Director.

APPENDIX.

The following extracts taken from the programmes drawn up by the special instructors in agriculture in the Education Districts of Auckland, Wellington, and North Canterbury respectively are here inserted in the hope that they may prove helpful and suggestive to teachers taking up nature-study in their schools.

1. SOME EXPERIMENTS IN ELEMENTARY AGRICULTURE FOR THE AUCKLAND PUBLIC SCHOOLS.

The simple school experiments given herein are intended to aid the teacher in carrying out a programme in elementary agriculture. Although these experiments are specific, and suitable apparatus is supplied to perform them, they are in no way intended to destroy the individuality of the teacher—that pervading spirit so necessary in nature-teaching. Other original experiments will occur to thoughtful teachers, and still other and more elaborate ones will be found in such excellent recent books as "Experiments with Plants," by Osterhout, 1905; "Agricultural Botany," by Percival, 1902; "School Gardening," Watkins and Sowman, 1905; "Nature-teaching," Watts and Freeman, 1904; and "Agriculture through the Laboratory and School Garden," Jackson and Dougherty, 1905. Working on the basis of one hour a week will permit of eighty-four half-hour lessons, or their equivalent, during the school year, and this time might be wisely and conveniently divided into three different phases of the subject—viz., (*a*) Indoor experiments with plants; (*b*) outdoor experiments with plants; and (*c*) experiments with soils, or experiments with milk, or other branch of agricultural science, as outlined elsewhere, allowing, say, twenty-eight half-hour lessons, or their equivalent, in each division. As, perhaps, only half this time can be devoted to practical and experimental work, only twelve or thirteen experiments have been suggested for each division; the other half of the time can easily be devoted to lessons on the principles underlying these experiments. The second-year experiments are based on the same plan, being slightly more advanced than the simple introductory ones of the first year, and milk-testing is recommended as the most suitable branch of agricultural science. In many localities dairying is the only industry of the people, and some simple experiments with milk, such as outlined, may be given to add a halo of interest to the commonplace, as well as to make education real, practical, and deductive. Experimentation is the oldest, soundest, and most potent method of training for power. It involves activity, observation, and deduction, which must be the expression of independent thought. The great axiom for all experimental work should be carefully observed, "Vary only one condition at a time." If lime, or bonedust, or steamed bone, or guano be used on a certain experimental plot, it is only folly to carry on another manurial experiment on that plot until the virtue of the slowly soluble manure has passed away, which, in many cases, takes several years. Better have few but constant manurial zones, and trustworthy results. Be content with the science or "Why" of agriculture; for the art or "How" is the business application, and not the work of the public school. "Agriculture is the oldest of the arts, and the most recent of the sciences." The beautifying of the school grounds should not be forgotten in our idea of what is practical. Why should not the rural school be the pride of the community, and a nursery where grows the childling to become a thrifty transplant in fields so familiar? Are not flower-beds, tree-culture, hedge-growing, shelter-provision, and native-tree planting intensely practical, if we would conserve the strong arms of the colony?

(A.) Indoor Plant Experiments.—(*a*.) First Year's Course.—Germination.

(1.) Keep one germinator moist, another soaked. Can seeds be too wet to germinate? Plant kernels of corn against the glass of a gas-jar as you fill it with sand, so that there are seeds at all depths. Make the sand thoroughly wet throughout. At what depth do most germinate? (2.) Try to germinate several kinds of seeds under water. Try rice. Will other seeds germinate under water? Why? (3.) Some seeds are better soaked before sowing. Test the drinking-power of some very hard, dry seeds, such as peas, beans, and corn, by soaking them in a square-shouldered bottle, causing it to break. (4.) Plant large lima beans, ten face down, ten on their sides, and ten on their backs, in a tray of wet sand, and observe how these seeds get a drink. Try corn in the same way. Why is it better to soak some seeds than to soak the seed-bed? Many seeds, such as wattles, &c., have to be steeped in hot water to effect germination. (5.) Suspend a variety of seeds by a wire or cloth gauze in a sealed glass jar which has a little water in the bottom. Can seeds get sufficient germinating-moisture out of a humid atmosphere? (6.) Make a little flannel garden on a plate. Better boil the flannel to get out the oil, and to sterilise it from blue mould. Crimp the moist cloth over seven or eight little sticks, to make aerated grooves for the seeds. Leave the ends of the rows uncovered. Have seven or eight rows of different garden-seeds. Note the period of germination of different seeds. (7.) Does light affect germination? Does air? Does temperature? Why use a black cloth? Why use sticks in the folds? What would be the effect of covering the plate garden with a sheet of glass? Then put in sunlight. Observe how the tiny roots pierce the cloth. Can they be withdrawn? Why? Of what use are root-hairs? Where do they grow? When the bean-radicle is an inch long, make marks on it $\frac{1}{16}$ in. apart, and observe where the root grows most. (8.) In another flannel garden sow wheat, oats, barley, and some grass-seed and clover. How do the cereals differ from the vegetables in germination? The grasses from the clovers? Notice the primary radicle or root of the pea, bean, radish, and clover, and the insipient secondary roots. Notice that such a root is followed by two seed-leaves (dicotyledons), while the fibrous roots of grasses and cereals are followed by only one seed-leaf (monocotyledon). Observe the incipient adventitious roots of grains and grasses, and how stolling or tillering commences. (9.) Plant three rows of different grains—say wheat, oats, and barley, four grains of each, in a flower-pot. Pinch off two of each when about 3 in. high, and watch the product of each individual grain. What are the advantages of tillering of grains? Is it an advantage in grasses? What grasses tiller most? (10.) Plant some large seeds, such as beans, cucumber, vegetable marrow, pumpkin, and onion, in a flannel garden, and observe the different methods of getting rid of seed-coats. (11.) Moisten some cress and mustard seeds in a saucer, and observe how a gelatinous covering imbibes water, and envelopes the seed in a jelly-like mass. Most of the mustard family have this imbibing property. Also linseed flax. What purposes are served thereby? Might not this sticky covering also help hold the seed-coat in the soil, and free the seed-leaves? Observe whether flax, cress, turnip, radish, cabbage, &c., do leave their seed-coats in the soil. Might not the spines on many seeds, such as carrots, dandelions, cockles, &c., serve a similar purpose? And some seeds have ridges—*e.g.*, pennycress, evening primrose, ox-eye daisy, lettuce, &c. Group garden-seeds into families by outward resemblance—carrot family, mustard family, melon family, bean family, beet family, &c. (12.) To show how seeds and seedlings get moisture from the soil, place a bunch of table raisins in a glass, and fill with water. Taste the water, and renew it again and again, until the raisins become plump (turgid) like the original grape. Taste. How did the water enter the raisin?

(A2.) Indoor Plant Experiments.—(*a*.) Second Year's Course.

(1.) Demonstrate that seeds and seedlings need air for germination. Try germinating a variety of seeds in sealed conical flasks of different sizes, 2, 4, 8, and 16 oz. When is germination prevented? When is growth checked? (2.) Burn a candle on top of some moist peas in a gas-jar, and then seal the jar, and compare germination with that of moist peas in a sealed gas-jar in which no candle was burned. Put a candle in the latter after the peas have sprouted. Why does the candle go out? On account of lack of something, not on account of the presence of something. What does a candle need in the burning? By means of a tube, breathe through some lime-water. What causes the clear solution to turn milky? Use some lime-water in a test tube, as a test for carbon-dioxide given off during germination. The taking-in of oxygen and the giving-off of carbon-dioxide in germination is called "respiration." It is a breaking-down process, and is wasteful of plant-substance. It takes place very rapidly in the budding and blossoming of plants. The soaked seeds weigh more before germination than after. How is this? Is germination growth? (3.) Place some soaked peas in one end of each of two U-shaped tubes, cork tightly, and invert the free end of one in a solution of caustic potash to absorb all the carbon-dioxide given off in germination, and the free end of the other in a solution of pyrogallic acid to absorb all the oxygen of the enclosed air before germination. Observe the extent to which these fluids rise, and when they rise. How is germination effected? What proportion of air is oxygen? If mercury were used as one of the fluids it would not absorb either the oxygen or the carbon-dioxide, and would remain at about its own level, showing that in most seeds the amount of carbon-dioxide given off is about equal to the oxygen taken in. (4.) Demonstrate that roots need air, by growing watercress in two vessels of water, one of fresh water, kept aerated with a stick, and the other of boiled water covered with oil. (5.) Water cultures may be successfully carried on with slips of Wandering Jew or Inch Plant (*Tradescantia*). A mere pinch of different artificial manures in a quart jar of water will keep this plant thriving for five or six weeks, and shows the value or effect of the different plant-foods. Keep the water-solutions well stirred and aerated. Unless an insignificant amount of nitrogenous manure is used, the plant will be hindered instead of helped. This is more or less true with all experiments with nitrogenous manures. (6.) Seedlings for class use can be easily grown in trays of moist sawdust. Only study the seed and the seedling as it develops. Don't pry a dry seed open to find its structure; let nature reveal herself. The seed will show its entire structure as it germinates. Even the smallest clover-seed will display all its parts on a magnified scale as it unfolds. Notice the germ of the wheat or corn as it "sprouts." Call attention to "albuminous" or "ex-albuminous" seeds as the seedling uses up the food that has been stored up for it outside the germ, or inside the seed-leaves, as the case may be. Does the bean always use up all the food within its seed-leaves? Why? Is the kernel of grain or corn always completely devoured by the seedling? Why? Is it usually devoured? Then, what advantage will large plump seeds have over the shrunken? What may be the disadvantage of planting very large potato sets? Frequently only a small portion of the set is consumed before the seedling has established itself independently, and the old set is left to rot and spread disease. (7.) Try seed-selection in a flannel garden or sawdust farm. Take 100 of each kind to get percentage. Pick out some wheat-germs with a knife-point, and notice that they perish as quickly as they germinate. Why? Test the germination of seeds you know to be green, immature, shrunken. What percentage germinates? (8.) Notice the "shepherd's crook" made by the radicle of most seedlings. What is gained by this bend? Beans pull off their seed-coats in this way—*i.e.*, by a *hypo*cotyl growth, but observe that scarlet-runners, peas, and acorns have an *epi*cotyl growth, and so leave the seed-leaves in the ground. Study a seedling karaka. (9.) Grow some seedlings in the dark. What is the cause of the etiolation or lack of colour? Notice how the light retards rapid growth, as well as establishes "plant-green" or chlorophyll, which soon transforms the weak, juicy seedling into a healthy, vigorous plant. But if light retards growth, why do plants turn towards the light? Are they not forced towards the light by the too excessive growth on the shaded side? What should be an important principle in conservatory and greenhouse structure? Of what use is chrorophyll to the plant? Water cultures may show that plants grown in the entire absence of iron will be but a pale green in favourable light. Account for the dark-green foliage on a volcanic soil. (10.) Ascertain the work of leaves by testing for starch. Pin thin sections of cork on opposite sides of intact nasturtium leaves; cover others with black envelopes, and allow to remain a night and a day. Then remove these leaves and others, and steep a minute in boiling water to kill the protoplasm (life-sap). Dissolve out the plant-green in alcohol, and test the colourless leaf for starch by putting in an iodine-solution. Explain results. Prove that iodine turns starch blue by adding a drop to a starch-solution, and also to a slice of potato. The alcoholic chlorophyll-solution may be separated into its component parts, blue and yellow, by adding a few drops of olive-oil or benzole to some plant-green in a test-tube. A few drops of weak acid or vinegar added to plant-green in another test-tube will afford a clue to the cause of discoloration of deciduous leaves. (11.) An interesting acid-alkaline test can be obtained by boiling some pickle or purple-cabbage leaves until a beautiful leaf-purple solution is extracted. After this has cooled, fill half a dozen test-tubes with it, and to one add a pinch of baking-soda, and the beautiful purple turns to a brilliant green, and a little vinegar turns another to a bright red. Try other household things of a similar nature, insipid and sour. Compare with the blue litmus test. Classify groceries and drugs as insipid (alkaline) or sour (acid). Why does the purple-cabbage water turn red on standing? Observe the mould that forms. How is vinegar made? (12.) Transpiration, or the water a plant liberates as vapour through its breathing-pores, or stomata, can be easily measured in the following manner: Carefully weigh a large kumara and place in a bowl. Keep a record of the amount of water supplied to the growing kumara by means of a 4 oz. glass measure. As the shoots multiply and the leafage greatly increases, the quantity of water imbibed in a day is surprising. At the height of its luxuriance allow it to absorb all the water and wilt. The combined weight of the kumara and its shoots is now taken, and if it weighs any more than the original kumara the difference should be taken from the total weight of water consumed to find out the actual amount that has passed from the leaves of the plant as vapour. The daily amount may exceed the weight of the plant. Transpiration, therefore, causes circulation of plant-juices. If one of the shoots were allowed to grow in an inverted conical flask, the deposition of this vapour could be watched. If a large leaf like magnolia, or meryta, be attached tightly to a bicycle-pump by means of a rubber tube tied over the leaf-stalk, and the blade of the leaf placed in a basin of water, air can be pumped through the leaf and out of the myriads of stomata on the under-side of the leaf. Bubbles will show where stomata are thickest.

(B.) Outdoor Experiments with Plants.—(*a.*) Two-years' Course.—The School Garden.

To grow vegetables only under uniform and most favourable conditions would not be experimental, and therefore would not be educational. It is not a question of how much can be grown on the limited area of a small school garden, but, rather, how much can be learned—that is, how many life lessons can be written on so many earth slates. We cannot reckon with profit—it is incompatible with primary and general education. Even large experiment stations cannot serve their purpose if profit be an aim. There is no such royal road to learning. This does not imply that the school garden should be a considerable expense. It simply means we should vary all the conditions we can, in order to learn all we can, and examine all the things we grow, that we may know how they grow. Varying only one condition at a time makes every operation an experiment. (1.) To show the effect of tillage, leave a portion of the garden untrenched, a portion trenched one spit deep, a portion two spits deep, and even a portion three spits deep. The rows of vegetables should run at right angles to these different tillage divisions, and cross all of them. Either no manure should be used on this area, or one manure uniformly over all of it. Then any apparent difference in the crop is due only to difference in tillage. (2.) To show the effect of manures, have the greater portion of the garden uniformly and suitably trenched, and divide this equally into three or four permanent manurial areas—say, (i) stable manure, (ii) superphosphate, (iii) blood-and-bone, (iv) no manure; or (i) compost, (ii) superphosphate, (iii) bonedust, (iv) no manure; or any three suitable manures, and a check area of no manure for comparison. These areas should be well defined, and not altered from year to year. The same manures should be renewed only when required or "run out." Long narrow beds crossing the four manurial strips will make every vegetable-row a trustworthy experiment in manures. Special and readily soluble manures, such as kainit, sulphate of potash, nitrate of soda, &c., may be applied with certain plants, but such is of doubtful educational or scientific value on such areas, and only small quantities of these expensive manures are supplied as show samples, or for very limited use. Better have few and reliable manurial experiments than confusion and folly. We cannot feed a plant as we can an animal—fresh diet in a clean dish. Slowly soluble portions of former meals remain in the soil, often for several years. What, therefore, can we conclude, if we add superphosphate to last year's bonedust, where, perhaps, there was a full quota of stable manure three years since? Have few and fixed manurial areas. (3.) Place small quantities of superphosphate, basic slag, ammonium-sulphate and guano on separate saucers. Notice the smell, if any, of each. Add a little fresh lime to each and mix. Notice the smell. What has been the reaction? Is this desirable? Should these manures ever be mixed with lime? With one another? Try small quantities. (4.) When is lime a necessary auxiliary to other manures? Sprinkle lime in the horse-stable. Account for the strong smell of ammonia. Uncork a hydrochloric-acid bottle in the stable. What causes the dense white fumes? Test the action of lime on nitrate of soda, and kainit. (Note.—Nitrogenous manures, which give such striking leafage results on the paddock, more often give reactionary results on the small school plots, or box culture, no doubt because their great solubility and strength has not been reckoned with, and invariably an overdose is given.) (5.) Potash, slag, and kainit may be mixed only at time of sowing; but the mixing of manures is not advised for educational purposes, as it only muddles matters, and in no case use prepared garden or potato manures, the composition of which is unknown. If a complete plant-food is desired, see that it is complete. Make out a table of the composition of the various manures. (6.) A few garden hints may well be observed: Come to a thorough understanding with your pupils before going outdoors. Discipline is necessary at all times; have a definite plan in mind. Never work the ground in cold or wet weather. Cover-crops for the winter will improve the heart and strength of the soil. Sow cover-crops sufficiently thick to kill weeds. Rotation is necessary to prevent soil-exhaustion. Cover-crops and rotation will give all concerned a legitimate rest. Always sow seeds in drills; drills are much easier kept clean, easier watered, easier thinned, and look better. Straight drills are easily made by drawing a small rope or straight pole or board back and forth on the bed. Children delight in sowing seeds twenty-seven times too thick, and thirteen times too deep. Give warning that the packet should sow a certain number of feet in the drills, or so many rows, and that the slightest covering will do—"twice the depth of the seed" means merely out of sight. Keep the ground well stirred around all growing crops. Roots need air, and hoeing conserves moisture. Nothing is gained by planting high-temperature seeds, such as melons, cucumber, beans, and maize, before hot weather. Grass-seed, sweet-peas, parsnips, onions, spinach, &c., germinate in cold weather, and make even stronger growth in cold soil. Make out a planting calendar for the year, and hang it on the wall for reference, also a seed guide, showing vitality, period of germination, number of seeds in an ounce, and the extent it will sow. Have a place for everything. Do not have garden-plots over 4 ft. wide. Children cannot reach over 2 ft. from the path. Square, finished garden-pegs are the corner-stones of neatness. If we do not begin carefully, drills, sowing, and thinning will be done in the same careless manner. Emphasize tidiness from the start. Label everything in clear letters that may be seen from the path. Date of sowing is important. That which is so well known at time of sowing is easily forgotten, and, besides, others wish to know. Grow for class use, not for show. Promote unselfishness. Ask each pupil for seedlings, &c., from time to time for class use. Study what is grown as it grows. Have pupils press seedlings from the garden and flowers from the beds, for purposes of winter drawing. It is much easier for the beginner to draw from the pressed specimen. Drawing from nature will follow. Transplant when thinning; for transplanting is economic, frugal, and educational. In flower-beds, best effects are produced by planting all of one variety in one place. Do not scatter or confuse. Massing gives a pleasing unity. Pluck the flowers that you may have all the more. Plucking promotes and prolongs blossoming, and schoolroom decoration becomes a necessary part of gardening. Pinch off terminal buds of cosmos and other slender plants, to improve shape and blossoming. (7.) *Potato Experiments:*—(*a*.) To show the relative value of the different varieties, procure 3 lb. (seed-sets about hen's-egg size) of each of three or four of the leading varieties. Obtain as much information as possible regarding the ancestry, health, and yield of each variety. Notice the promising features of each variety before planting, such as shallowness of eye, smoothness of skin, constancy and compactness of shape, prominence of terminal bud, &c. Plant these varieties under similar conditions, either with one suitable manure, or have the rows cross each of the manurial areas above recommended. Date of sowing and time of maturity should be noted and compared; the yield from the 3 lb. should be weighed and stored for winter study. Then the tendency to succumb to rot, the keeping-quality, and the peculiarity and structure of each variety may be observed. Keep the best for next setting. (*b*.) To show the different ways of planting sets, 14 lb. to 28 lb. of one good variety will be needed. If the rows are 20 ft. long, take twenty potatoes for each trial. Row No. 1: Whole sets, 1 ft. apart. Row No. 2: Terminal half, 1 ft. apart. Row No. 3: Stem half, 1 ft. apart. Row No. 4: Oblique cuttings from tip to stem, with terminal bud. Row No. 5: Other half of No. 4. Row No. 6: Thick peelings containing all the eyes in order. Plant on moss. Row No. 7: Terminal bud only, with small portion of pulp attached. Plant with moss to conserve moisture. Row No. 8: Remaining portion of No. 7. Row No. 9: Properly sprouted sets—*i.e.*, ones in which only the growth of the terminal sprout has been encouraged, and this sufficiently hardened or strengthened in partial light. Row No. 10: The separated sprouts might be tried, like the kumara. They will strike root in wet sand. Row No. 11: Sets 8 in. deep. Row No. 12: Sets 2 in. deep. Of what practical importance is "bud setting"? Are buds or potato-eyes ever sent through the mail? Might not the removal of eyes from a diseased tuber give an undiseased set? What is the danger in planting large sets? What is gained by proper sprouting before planting? (*c*) Special treatments: Row No. 1, no treatment; row No. 2, spoonful of sulphate of potash with each set; row No. 3, spoonful of muriate of potash with each set; row No. 4, handful of ashes with each set; row No. 5, spoonful of sulphur with each set; row No. 6, two spoonfuls of kainit with each set; row No. 7, two spoonfuls of superphosphate with each set. (Note.—The needs of a plant can be well ascertained from its composition. Take the composition of the potato, for example—80 per cent. water, from soil-moisture and rainfall; 1 per cent. ash, from various mineral salts in soil; 0·2 per cent. nitrogen, from nitrification of humus in rich soils or addition of a small quantity of sulphate of ammonia to depleted soils; 0·1 per cent. phosphoric acid, from some soluble phosphate; 0·3 per cent. potash, from some form of potash. Now, to produce 10 tons of potatoes per acre, $2240 \times 10 \div 1000$ or 22·4 lb. of phosphoric acid will be necessary. The most soluble phosphate—*i.e.*, superphosphate—should contain 15 per cent. phosphoric acid, and theoretically $1\frac{1}{2}$ cwt. of superphosphate should supply the required amount of phosphoric acid; but practically it is found that 3 cwt. gives better results. In like manner, the quantity of potassic manure is ascertained. Three-tenths per cent. of 10 tons is 67·2 lb., so that 1 cwt. of sulphate of potash (95 per cent. pure) is little enough. Sulphate of potash improves the quality as well as the quantity of potatoes, but muriate (chloride) of potash is said to promote clamminess. Excess of nitrogen should be carefully avoided, as big tops are often produced at the expense of the tubers—*i.e.*, excessive building limits storage. So we may conclude that a simple and efficient potato-manure may be made with three parts of "super" to one of sulphate of potash. Likewise, the needs of other plants may be ascertained from their "make-up," which is the result of their "likings" or "preferences," and surely such independent and intelligent reckoning is of more educative value than the application of unknown mixtures in time-honoured quantities. Let there be some "boy" reckoning, that there may be boyhood understanding. (8.) *Seed-selection*:—Observe how Nature disposes her seeds in an ear of maize, in a cucumber, a watermelon, a pumpkin, a vegetable marrow, a pea-pod, &c.—the most perfect in the middle, as we would naturally expect. The malformed and stunted seeds at the ends of these long fruits are usually immature and will not germinate. The black-seeded watermelon at maturity will have a considerable portion of its seeds at either end small, white, and imperfect. There is "survival of the fittest" even in the nourishing and maturing of seeds. Examine a spikelet of oats, wheat, barley, and prairie-grass. How many grains are produced in each? Where are the largest? How many look fit for seed? How may they be separated from the imperfect and unfit in the winnowing process? (*a*.) Hand-pick a head of ripe oats into three classes—viz., bottom grains, middle grains, and tip grains—and sow in above order in a row. Compare the plants that spring therefrom. Other cereals and large grasses may be treated in like manner. (*b*.) Break off a small portion from the tip and butt of an ear of maize. Shell off the kernels from the three portions and plant in the natural order, in a long narrow bed. You have buried an ear of maize just as nature disposed the seeds, and the result is a good object-lesson in seed-selection. (*c*.) Row No. 6 [7 (*b*)], with thick potato-peelings containing all the "eyes" in order, is an equally good object-lesson in "bud-selection." (*d*.) Make it a point to examine the seed of every packet, and, if a difference is noticeable, have it separated into best and poorest and sown at different ends of the plot. (Note.—The continued practice of selecting the best grains from the best heads of the best varieties has given us beardless and hull-less barley from the wild barley-grass, the cultivated oat from the wild oat, and wheat from a grass called *Ægilops*. Seed-selection is the chief agent in plant-breeding, and plant-breeding is a science with endless possibilities. Let us awaken the young mind to these possibilities. "Those who improve plants are true benefactors.")

(C.) Experiments with Soil.—(*c*.) First Year's Course.

(1.) Cover a school table with a large piece of thick brown paper. On it draw a map of the school district, showing roads and farms. Have pupils bring samples of the different surface soils from their farms, and place them in their respective places on the table map so as to make a soil relief map of the district. Have maps made of this, naming the different soils laid out in different colours. Give depth, also give the natural vegetation found on the different soils. A subsoil relief map might also be made, and a map made on the same scale as the former one. If the surface-soil map be made transparent with oil or kerosene, or made on tissue paper, and placed on the subsoil map, a clear idea can be obtained of the soils of the district. A simple colour scheme might be adopted—brown for old volcanic soil; red for volcanic loam; yellow for clay, gum land, and heavy soils; orange for pipeclay, fireclay, &c.; blue for alluvial soils and silts, and pumice plains; black for swamp soils and marls; white for sandy soils. The deposition and origin should be accounted for as far as possible. Have existing streams and rivers arranged or distributed any of the soils of the district? How do the soils of the hills compare with those of the valleys or lowlands? Does the natural vegetation differ with the different soils? How do the surface soils differ in colour? Compare with the colour of subsoils. (2.) Heat some of the darker soils on the stove. Observe any smoke, and account for the change in colour. Why do volcanic soils become redder on being heated? Why does the iron stove become red with use? From what mineral substances are the cheap red, brown, and yellow paints made? (Hæmatite, or red iron-ore, and brown bog iron-ore.) With what did the Maoris paint their canoes, whares, pa-gates, totems, &c.? What colour predominates? Have you seen a soil of similar colour? Obtain a sample, if possible. How might its colour be increased? How was the Maori paint prepared? Iron is credited with producing plant-green and intensifying the greening of the foliage. Have you noticed a darker-green foliage on volcanic soils than on other soils? (3.) *To test for Nitrogen and Humus in Soils*:—Place a small lump of different soils about the size of a marble, from the blackest swamp-soil to the colourless subsoil, in as many different test-tubes, and add five times as much of 10-per-cent. solution of caustic potash, made by dissolving a stick of potash in ten times as much water. Heat each to boiling, and allow to stand for five minutes. Compare colours. Black or opaque is an indication of a very rich soil; brown, fairly rich in nitrogen; amber, rather poor soil; and yellow, very poor, depleted soil. Is the colour of the soil a safe guide as to humus or richness of soil? Test a jet-black muck found in swamps for humus and nitrogen. There may be little or no colour reaction with caustic soda. Nitrification has been prevented in the absence of air. How can such swamps be improved? Some samples of white gum land give a fair test for nitrogen. Clay has a great affinity for ammonia. (4.) *To test for Lime in Soils*:—A drop of hydrochloric acid on limestone causes an effervescence, or minute gas-bubbles, due to the formation of chloride of lime (calcium) and the liberation of carbon-dioxide, for lime is the carbonate of lime. If lime is present in excess in soils, a drop of hydrochloric acid will cause a slight bubbling or effervescence. If such cannot be detected, inquire if any crust or scale forms on the inside of the tea-kettles in the district, and ask for samples, if any. Test with hydrochloric acid. What conclusion? Where did the lime come from? Whence did the water get the lime? By means of a rubber tube breathe through a sample of the district water for some time. Do you notice any change of colour? Ten to 15 per cent. lime is an excess in any soil, and a drop of the above acid will detect it in such quantities. One to 2 per cent. is sufficient in sandy soil, and one-half this amount in clay soils. Is lime sour, sweet, or insipid to the taste? What effect will it have on sour soils? Add a pinch of fresh lime to turbid clay-water in a test-tube, and observe after an hour. What effect has lime on clays? Is this beneficial? Add a pinch of fresh lime to some sulphate of ammonia, and mix. Notice the strong odour. What is the effect of lime on nitrogenous manures? On potassic manures? Explain: "Lime enriches to-day, but impoverishes to-morrow"; "Lime, and lime without manure, makes both farm and farmer poor." (5.) *To test for Sourness in Soils:*—Add some of the soil to a jar of water, and shake. Allow to settle and stand for a day. Test with litmus paper. The rapidity and extent of the reddening of the litmus paper is an indication of the acidity of the soil. The amount of fresh lime necessary to restore blue to the litmus might be taken as a further test of the sourness of the soil. A lump of the soil added to purple-cabbage water and allowed to stand for a day will also give a good test. If the purple-cabbage water around the lump of soil is turning red, the soil is sour, and the extent of the reddening indicates the amount of acid present. What plants thrive on acid soils? Are they of any economic value? What colour are the stems of most acid plants? Is this an acid colour? To what extent may plants be looked upon as soil-indicators? (6.) *To test for Alkalis in Soils:*—Proceed as in the acid-test above, remembering that alkalies turn litmus blue instead of red, and turn purple-cabbage water green. This test will be of little practical value in New Zealand, as most of the soils are either volcanic (hence acidic), or decomposed acidic rocks, such as pumice, obsidian, rhyolite, trachytic pumice (scoriæ), trachyte, and andesite (blue metal). However, near the sea, and around such inland arms of the sea as the Manukau and the Waikato, excess of various salts will be found. Test. Account for the black turf on a whitish subsoil near the sea and around tidal rivers and ocean inlets. What is the colour of foreshore muck and tidal mud-flats? Add some washing-soda to a green compost made of crushed leaves and herbs, fibrous roots, and grass. Sprinkle with water occasionally. Examine in a fortnight. What is the colour of the compost? Has any decomposition taken place? Sodium-carbonate (washing-soda) is often called "black alkali" in arid or semi-arid districts. The addition of sulphate of lime (gypsum, plaster-of-paris, land-plaster) to "black alkali" (washing-soda) changes the latter to "white alkali" (sodium-sulphate), which is much less injurious to plant-life than the "black alkali." Of course, the excess of any alkali is injurious to vegetation, as well as to tilth, causing crusting, puddling, and hard-pan. Place a little common salt in the bottom of a glass tumbler, fill with wet sand, and allow to stand in the sun for a few days. What causes the whitish crust to form? Expose some sulphate of potash in an open paper sack for a time. What causes the sack to become wet, and the salt to become soft and sticky? What happens to table-salt in wet weather? Not only are alkalies very soluble, but most of them have a great affinity for water—*i.e.*, deliquescent. This property of absorbing moisture makes limited amounts of such salts valuable conservers of soil-moisture, but excesses of them causes puddling, or stickiness of soils. Excess of muriate of potash in potato-manures even causes clamminess in the potato. As bulbs prefer cold wet ground, excess of sulphate of potash is often added to conserve the soil-moisture. One ounce to the square yard would be considered an excess, and might make the soil too clammy. What plants grow on alkaline deserts and salty places? What trees thrive near the New Zealand coast? What plants are found growing in the sand along the New Zealand coast? To what family do most of them belong? Saltbush, New Zealand spinach, fat-hen (lamb's-quarters), atriplex, and Russian thistle, so common along the sea-coast, are much alike in habit, taste, flower, and seed. They belong to the goosefoot family, which has an ancestral liking for salt. Most of them have a salty taste, and are adapted for living in hot, dry, arid places. Beets and mangolds are members of this family, and hence salt is commonly added to the soil as a necessity to their growth. Such plants are called halophytes, or salt plants. Sprinkle a handful of salt on a square yard of healthy clover turf. Note the effect. Explain. What is the great disadvantage in using salt as a weed-killer? How can excess of alkaline salts be removed from soils? What manures would have a neutralising effect on alkaline manures or alkaline soils? What is the chief difference between superphosphate and Thomas's phosphate? How is the former made "super" and the latter "basic"? How does basaltic rock differ from volcanic rock? What will be the nature of residual soils formed by the disintegration of coral, sea-shells, chalk, or limestone? What would be the best manures for such soils? (7.) The test for phosphoric acid in soils is too complicated to be recommended for public schools. Since one-tenth of 1 per cent. phosphoric acid is considered a good percentage in soils, and since the most careful handling of ammonium-molybdate, nitric acid, and ammonia is necessary to detect it, it is readily seen why it is not recommended, valuable as it might be to know the need of a soil for this essential element of food-plant. (8.) *Mechanical Analysis of Soils:*—To make apparent to the eye the composite character of soils. (*a.*) Put a sample of the garden-soil in a specimen-tube, fill with water, and shake thoroughly. Quickly stand the tube erect and allow to settle. Retain it as a permanent record of the water-gravity separation of the soil into its component parts. Visit a little stream, and show that the stream also separates in like manner the soils it passes through. In like manner the river, on a large scale, analyses the soil of its drainage-basin. Where are the coarse gravels deposited? The coarse sands? The fine sands? The silts? The clay sediments? What soils compose alluvial fans and deltas? In reality, which are the heavier soils—clays or sands? A cubic foot of dry sand weighs from 105 lb. to 110 lb., and a cubic foot of dry clay 70 lb. to 80 lb. What is meant when we speak of "heavy" clay soils and "light sandy soils"? (*b.*) Arrange in a series directly above each other a large glass beaker, a fine coffee-strainer, a medium coffee-strainer, and a coarse coffee-strainer respectively. Pulverise a large tablespoonful of garden-soil or other sample to be analysed, and place it it in the top and coarsest sieve. Gently add water from above, which will quickly pass through each strainer in turn to the beaker below, carrying with it such particles of soil as will pass through each mesh. Keep the deposits in the strainer well stirred, and allow water to pass through till it comes forth clear at the bottom, and empty the lower beaker as it fills into other beakers, which are allowed to stand and settle. The top coarse sieve will retain only small gravel and bits of roots, humus, &c. The next sieve will retain only the coarse sand, and the finest sieve will retain only the fine sand. The clays will pass through and settle down as sediments in the bottoms of their respective vessels in order of coarseness. These six or seven component parts may be removed to a sheet of blotting-paper and more carefully examined. A permanent record might then be made by putting them in a glass tube in order of coarseness, separating each by a paper partition. This experiment is worth doing carefully for purpose of awakening the mind to the composite character of what we casually take to be one simple thing—soil. The hand-lens will further aid in seeing the wonderful "make-up" of a lump of earth. How many score of times larger is a sand-particle than a clay-particle? Of what are sand-particles made? What percentage is clear, like glass (quartz)? Of what use are roots in soil-formation? What class of plants are most useful in improving the soil—those with surface roots or those with deep roots? Compare clovers with grasses in this respect. Classify soils according to proportions of sand and clay. If sand is the principal part, we call it a sandy soil; if clay, a clay soil; if about equal proportions of each, a loam; if somewhat more sand than clay, a sandy loam; if more clay than sand, a clay loam. The presence of humus makes it a rich sand or a good clay, &c. (9.) *Properties of Clay:*—(*a.*) To show Flocculation: Fill six test-tubes in a stand with turbid clay-water. To the second one add a pinch of fresh lime, and shake; to the third add gypsum (plaster-of-paris), and shake; to the fourth, alum; to the fifth, salt; and to the sixth, weak sulphuric acid; leaving the first untouched for comparison. Observe from time to time, and note any changes in the clearness of the turbid clay-water. The things added are commonly found in soils. The lime and gypsum soon cause a flakiness, or flocculation, and in the course of three hours these floccules fall to the bottom and leave the water clear. The acid and alum should help precipitate the clay in four or five hours, but in an entirely different way. The salt will require twelve to twenty hours to accomplish the task, and the untouched clay-water will remain turbid for a day or so. Must not such clay be very fine to remain in suspension for so long? What will happen to such a soil when it dries? When it is worked wet? Is its fineness an advantage to the farmer? What is the effect of lime on the clay-water? What is "flocculation"? How does lime improve the texture of clays? (*b.*) To show Shrinkage: Fill a small narrow box with puddled or plastic clay, and put in the sun and wind to dry. Account for the great shrinkage and cracking. Measure carefully, and estimate the extent of the shrinkage on all dimensions. Refill the box with a mixture of fresh lime and plastic clay, and put out to dry as before. Has the shrinkage been as great? Will the soil crumble more easily? Lime makes clay more friable—*i.e.*, coarser in texture and more crumbly. A mixture of sand and clay might be tried in a similar manner. (*c.*) To show Affinity for Ammonia: Fill a tubular lamp-chimney with fine clay, and another with fine sand or other light soil. Stand each in a saucer, and add an equal quantity of household ammonia to each from above and sufficient to percolate through into the saucer. In which saucer is there the least smell of ammonia? How is this? Other soluble foods, such as dung-liquor, phosphoric acid, potash, &c., are retained or fixed by clay, lime, magnesia, and iron. This property is known as the "fixing-power" of clay. (10.) (*a.*) To show Porosity—*i.e.*, capacity of soils to take in rainfall: Pour equal quatities of rain-water through lamp-chimneys containing various soils, and collect and compare. What percolates through? Which soil continued dripping longest? Discuss the value of this. (*b.*) To show Capillarity—*i.e.*, power of soils to take up moisture from below: Stand chimneys of soil in a tray of water, and observe height to which moisture is drawn.

(C2.) Experiments with Milk.—(*a.*) Second Year's Course.

(1.) *To show Percentage of Cream in Milk:*—Fill a cream-tube to 0 with fresh milk, and allow to stand for a day. Observe the depth of cream at the end of six hours; after twelve hours; after twenty-four hours. Measure the depth of cream in sixteenths of an inch, and the total depth of milk and cream in sixteenths of an inch. What per cent. is cream? How does your calculation compare with the reading on the graduated portion of the cream-tube? From a number of such tests, what do you find to be the average percentage of cream? Why is the cream-tube graded downwards, and only to 30? What does this "30" mean? Complete the graduation to the bottom. What does 100 per cent. mean in a cream-tube? Could this amount possibly be exceeded? Why? Define 100 per cent. What proportion of cream rises in six hours? In twelve hours? Does any cream rise after twenty-four hours? Study conditions most favourable for cream-separation. Fill two cream-tubes at the same time from the same fresh milk, and set one in warm water and the other in cold running water. Observe at six, twelve, and twenty-four hours the exact percentage of cream separated, and compare. Upon what does the gravity separation of cream depend? How does high temperature affect density? Low temperature? At what temperature is water most dense? At what temperature will milk, which is 88 per cent. water, be most dense, and therefore most quickly separated from cream, on account of the maximum difference of densities? Does your experiment corroborate this? (2.) *To show Percentage of Butter-fat in Cream:*—Collect cream from the cream-tubes to fill the pipette to 17·6 c.c., and transfer to the Babcock cream-bottle. Add an equal volume of sulphuric acid from the acid-measure. Shake well, and add hot water to fill to 50 in the neck. Keep the bottle in hot water until all the oil-like butter-fat collects in the neck. What per cent. is indicated? Ascertain this by spanning the depth of fat with compasses or calipers, and shift to read from 0. How does your estimate compare with the average factory test? What is the maximum amount of butter-fat found in cream? The minimum? The average? What per cent. would this be of the whole milk? Forty per cent. butter-fat in cream that formed 12 per cent. of the whole milk would be equivalent to 4·8 per cent. butter-fat in milk. Thirty-three per cent. butter-fat in cream forming 15 per cent. of the whole milk would be equivalent to 5 per cent. butter-fat in milk. Make a milk-test similar to the above cream-test from the same milk to verify this. When is the cream-test used? When is the milk-test used? How do the respective test-bottles differ? Why? What is the action of the sulphuric acid in both cases? Feel the bottle just after it has been added; why hot? How does the high specific gravity of this acid aid in the fat-separation? How does 900 revolutions per minute aid in the separation? How much butter would you expect to get from the churning of 100 lb. of cream? What is the other part? Is butter pure butter-fat? Melt a small amount in a test-tube and see. In what are the oil or fat drops floating? The cream from 100 lb. of milk testing 3 per cent. butter-fat should yield 3½ lb. of butter. How is this? Explain "overrun" in factories. (3.) *To get Butter direct from Milk*:—Borrow a gallon glass churn from the nearest merchant, or from a dairyman who may have one of these excellent and clean little churns, and churn a gallon or 10 lb. of milk. If the churn is placed in cold water, five or ten minutes' turning should bring butter, and the formation of it can be seen through the glass. Weigh carefully the amount of butter obtained. What per cent. is it of the 10 lb. of milk? What are the disadvantages in churning whole milk? What kind of butter is obtained? Do you know any people who prefer "sweet" butter? To what extent does cream-separation economize churn-room? Set aside the buttermilk from the above churning, and observe if cream forms on it. What prevents the complete churning of the butter? What is the use of a paddle in the churn? Drop some mercury on a slate so that it separates into a thousand globules. Churn these together again, by hitting them with a ruler. Butter-fat is in oily drops or globules throughout the milk or cream, and churning is simply the knocking of the small globules into larger globules, and the larger into lumps of butter. How does whole milk retard this process? How does cream-separation make it more easy and more complete? (4.) Cream-churning is too common to be necessary in the schoolroom, but pupils might be asked to note the number of gallons of cream churned at home, multiply it by nine (the number of pounds of cream in a gallon; why not ten?), and weigh the butter, to ascertain the percentage it forms of the cream churned. In which is there the more profit, cream at 2s. a quart or butter at 1s. a pound? (5.) *To estimate the Value of Milk for Cheese-making*:—Heat half a pint of milk to 86°, and add five or six drops of rennet, and stir around in one direction until it begins to thicken. Let it stand until a firm curd forms, when the whey may be drained off, and the curd dried on blotting-paper and weighed. Half a pint of milk should produce 1 oz. of curd (cheese), and a gallon of milk should produce 1 lb. of cheese. How much cheese should ten gallons of milk make? How much butter? How do these products compare in price? Which is the more profitable? What is the action of the rennet on the milk? Taste rennet by touching the cork to the tongue? From what is rennet made? What change takes place in milk during the process of digestion? Test rennet with blue litmus paper, or purple-cabbage water. Add a little vinegar to milk in a test-tube, and note the time necessary for curdling. Add a little dilute acid or lemon-juice to another sample. What does the strong sulphuric acid do in the milk-test? (The dissolving of the curd or casein and all other milk-solids than fat causes a great evolution of heat, exceeding boiling-point.) Will milk curdle of its own accord? Why? Try and taste. What is whey? What is the chief ingredient in cheese? Melt some cheese in a test-tube, and pour off the butter-fat. (6.) *To show Albumen in Milk*:—When the white of an egg is heated it coagulates or thickens into a firm white substance, known as "albumen." Heat some milk in a graniteware mug to 160° Fahr., or more, and notice the tough scum that forms on the surface. Compare it with egg-albumen. What amount do we find in milk? (Seldom over the half of 1 per cent.) Do we find it on heating butter or cheese? What becomes of it? (Albumen is responsible for the very disagreeable odours in decomposing milk and whey.) (7.) Remove the albumen scum from the above sample, which has been heated to sterilisation, or, rather, pasteurisation point—viz., 150° for twenty-five minutes, 155° for fifteen minutes, or 168° for ten minutes. Cool the milk suddenly to 50°, and allow to stand in a tightly corked bottle for three days. Compare its keeping qualities with a sample of the same milk which has not been pasteurised. Taste each after twenty-four hours, after thirty-six hours, after forty-eight hours, after seventy-two hours. What is the effect of pasteurisation on milk? (The above temperatures for the stated times kill tubercle bacilli—that well-known germ, which is commonly found in milk, and where it rapidly multiplies. The sudden cooling is as necessary as the heating.) Does pasteurisation impart a "burnt" taste to milk? (For the complete destruction of all germs a temperature higher than boiling-point is necessary, but this literally "cooks" the milk. Dairy apparatus should be washed in boiling water, however, to effect sterilisation.) (8.) *To show the Effect of Cleanliness on the Keeping-quality of Milk* (co-operative home experiment:—Boys on the dairy farm can easily demonstrate the importance of cleanliness around the dairy. After handling bars, and gates, and tie chains, and ropes, &c., proceed to milk the cow with the dirtiest teats into an unwashed, unscalded pail. When a quart is obtained, set aside, brush the cow's udder, and wash the teats with a damp cloth; wash the hands in warm water, and milk directly into a pint bottle, which has been thoroughly cleansed and scalded. When full cork tightly, and fill a similar but unscalded bottle or one that has milk in it before from the same sample. Bring both bottles to school, labelled A and B, and the next day let the class note if any bad odour has developed in either bottle, and taste. Cork again, and examine on the third day. Test with litmus paper to see if either is getting sour. Does cleanliness have any effect on odour? on flavour? on souring? What is the cause of souring? of bad odours? Whence the origin of germs? How may they be killed? Cleanliness with everything; scalding water for pails, pans, separators, &c.; whitewashed pens, stables, sheds, gates, &c.; and sunlight and fresh air in the dairy are principles underlying colonial pride and first-grade butter. (9.) Nearly fill a 10 in. gas-jar with fresh milk, and place the lactometer in it. Notice the point on the narrow neck of the lactometer at which it stands in the milk. Remove it, and place in a gas-jar of water. Compare the depth to which it is immersed with the depth in milk. Pour out half the milk, and replace with water. Immerse the lactometer in it and take the reading. How does it compare with the two former readings? Of what use is the lactometer? What is the average specific gravity of whole milk? of half milk? of milk one-tenth water? What is the minimum standard of pure milk? This may vary in different townships, but 1·029, or 29 on Quevenne's lactometer, is a common standard. The Quevenne lactometer just reads the thousandths of times milk is heavier than water, so that 0 will mean water-density, and 30 will mean that 1,000 c.c. of such milk would weigh 1,030 grams. The addition of one-tenth water will cause it to read 27 (1·027), and 15 (1·015) indicates one-half water.

How will skimming affect the lactometer? (Butter-fat is only about nine-tenths as heavy as water.) How can skimming be detected by means of the lactometer? Study the principle of the lactometer. (10.) Study the construction of the Babcock milk-tester bottle. The graduated neck from 0 to 10 should contain exactly 2 c.c. This amount of water would weigh exactly 2 gms.; of butter-fat, 1·8 gms., and graduated to read 10 per cent. of whole volume of milk taken. What must be the volume of milk taken? (2 × 0·9 × 10 ÷ 1·030.) Why are the pipettes marked 17·6 c.c., or slightly more than the exact amount? What determines the amount (17·5 c.c.) of sulphuric acid taken? (11.) Visit a butter-factory, and make a complete diagram of the entire butter-making process as an aid to oral narration or composition on the same.

Apparatus and Material for the First Year's Course.

A1. *Indoor Plant Experiments* (28 half-hour Lessons):—1 doz. Zurich germinators; 1 fancy germinator; 2 yards black flannel; 4 sheets thick glass, 12 in. by 10 in.; 2 doz. fibre flower-pots, 4 in.; 6 graniteware plates, 10 in. B1. *Outdoor Experiments with Plants* (28 half-hour Lessons):—The following set for every eight pupils: 1 spade; 1 fork, 4 prongs; 1 Dutch hoe; 1 draw hoe; 1 rake, 10 teeth; 1 weed-fork; 1 trowel; 1 garden-line, 33 ft.; 8 yards netting; 1 watering-can. C1. *Experiments with Soils* (28 half-hour Lessons):—2 doz. test-tubes, 6 in. by ½ in.; 1 doz. specimen-tubes, 6 in. by 1 in.; 1 nest five beakers, 5 oz. to 12 oz.; 1 retort-stand and 3 iron rings; 1 test-tube stand for 6; 3 coffee-strainers of different mesh; 3 coarser sieves of different mesh, 6 in. by 6 in.; 4 tubular lamp-chimneys; 2 oz. sulphuric acid; 2 oz. hydrochloric acid; 2 oz. ammonium-hydrate; 2 oz. caustic soda; ½ lb. lime; ½ lb. calcium-sulphate. D1. *Agricultural Science* (28 half-hour Lessons):—½ gross 1-drachm screw-cap vials, for seed-collections; ½ lb. potassium-cyanide; 2 doz. sheets felt paper, 1 ft. by 1½ ft., for plant-pressing; 2 doz. sheets mounting-paper, 1 ft. by 1½ ft.; 1 yard wire screen for terrarium; 2 lb. copper-sulphate; ½ lb. formalin.

Apparatus and Material for the Second Year's Course.

A2. *Indoor Plant Experiments* (28 half-hour Lessons):—4 gas-jars, 10 in. by 2 in., ground top; 4 conical flasks, 2 oz., 4 oz., 8 oz., 16 oz.; 2 thistle funnels, 6 in.; 1 glass funnel, 4 in.; 2 U-shaped tubes, 4 in. by ½ in.; 2 doz. test-tubes and stand for 6; 1 doz. rubber corks, ½ in. solid and 1 hole; 1 bottle methylated spirit; ½ lb. caustic potash, sticks; ½ oz. pyrogallic acid; ½ oz. iodine; 1 oz. cobalt-nitrate; ½ pint benzole; 1 indelible ink for zinc; 1 measuring-glass, 4 oz. B2. *Outdoor Experiments with Plants* (28 half-hour Lessons):—14 lb. superphosphate; 7 lb. kainit; 7 lb. basic slag; 14 lb. bonedust; 4 lb. guano; 4 lb. ammonium-sulphate; 4 lb. potassium-sulphate; 4 lb. nitrate of soda; 4 lb. dried blood; 3 lb. sulphur; 100 waterproof labels; 1 pair secateurs, 5½ in.; 1 budding-knife; 1 tin grafting-wax; 1 pruning-saw, 18 in. C2. *Experiments with Milk* (28 half-hour Lessons):—2 cream-tubes; 2 Babcock bottles, milk and cream; 1 pipette, 17·6 ccm.; 1 acid-measure, 17·5 cc.; 1 cyl. measure, 100 cc.; 2 lb. sulphuric acid; 4 oz. rennet; 2 litmus books, blue and red; 1 Quevenne lactometer, therm F.

II. EXPERIMENTS IN NATURE-STUDY FOR CLASSES FOR TEACHERS IN THE WELLINGTON EDUCATION DISTRICT.

Preliminary Experiments.—(1.) Dry some grass under a closed vessel, and notice formation of dew. (2.) Weigh a small quantity of grass, dry in a moderate heat till it reaches the condition of hay, then weigh again. (3.) Heat the dry grass on a hot surface till it becomes black, then weigh. (4.) Make the charred grass red-hot in an iron spoon or crucible; weigh the remaining ash. Compare weights of organic and inorganic constituents of grass.

The Composition of Air.—(1.) Weigh a quantity of bright iron-filings in a saucer, moisten the filings and expose to air for several days, stirring occasionally, then dry, and weigh again. (2.) Place some bright iron wire in a flask containing water. Boil the water for fifteen minutes to expel air, then cork up tightly, and leave for several days. Does any change take place in the appearance of the wire? (3.) Uncork the flask, and again allow to stand for a while. Examine, and try to account for any change in the condition of the wire. (4.) Moisten the inside of a test-tube or bottle, sprinkle iron-filings inside, and invert in water. Ascertain what proportion of gas remains after two days, and test with a lighted taper to see whether it differs from ordinary air. (5.) Burn phosphorus in a jar over water, and proceed as in last experiment. (6.) Heat red oxide of mercury in a test-tube, and notice the changes that ensue. Test the gas given off with a glowing splinter, held well down the tube. What happens to some of the globules of mercury as the tube is allowed to cool? (7.) Produce oxygen in quantity by heating chlorate of potash (two parts) and dioxide of manganese (one part by weight). Collect the gas in bottles over water. (8.) Test the gas in one bottle with a glowing splinter to ascertain whether it is the same as that produced from the oxide of mercury. (9.) Burn (*a*) charcoal, (*b*) sulphur, (*c*) phosphorus, (*d*) iron wire, (*e*) magnesium wire, (*f*) sodium, in separate bottles of oxygen, and note the results when the products of combustion are tested with litmus-solution. *Carbon-dioxide:* (10.) Pass a current of air through a hard glass or iron tube, in which some charcoal is heated to redness, and by means of a bent tube allow the gas produced to bubble through lime-water. (Note: The air may be conveniently forced through the tube by means of the rubber bulb of a scent-spray or a pair of bellows.) (11.) (*a*) Breathe through lime-water by means of a glass tube; (*b*) allow a saucer of lime-water to stand for a time in the room. (12.) Heat some chalk or limestone to redness in a hard glass tube, loosely corked, then pour the gaseous contents into another tube containing lime-water, and shake the latter. (The experiment may also be performed with the apparatus used for experiment 10.) (13.) Place some pieces of limestone or marble in a generating-bottle, add hydrochloric acid, and collect the gas either by downward displacement or over water. Allow some of the gas to bubble through lime-water. (In these four experiments has the gas produced the same effect on lime-water?) (14.) To ascertain the composition of the gas: (*a*) Burn charcoal in oxygen, and test the resulting gas with lime-water; (*b*) burn magnesium wire in a bottle of carbon-dioxide, and note the black deposit in the resulting ash. What is this black matter? *Carbon-dioxide:* (15.) Lower a beaker into a jar of carbon-dioxide, draw it out again, and pour the gas into a narrow beaker, at the bottom of which is a burning taper. (16.) Balance a beaker of air on the scales, and pour in carbon-dioxide from a bottle. (17.) Invert a test-tube of the gas in a beaker of water, and allow it to remain there for a few days. (18.) Pass carbon-dioxide through a beaker of water, thus producing carbonic acid, and divide the liquid into three parts (*a*, *b*, and *c*). To *a* add a few drops of litmus-solution; then heat the solution, and notice the restoration of the blue colour. To *b* add a few drops of lime-water. Boil *c* for a few minutes, and then test with lime-water. (19.) Effect of carbonic acid on marble or limestone: Pour some distilled water on some fragments of the stone, and then add a few drops of ammonium-oxalate. If *any* lime has been dissolved, there should be a precipitate of oxalate of lime. Next place some lumps of marble in water containing carbon-dioxide in solution, allow to stand for a short time, and then test for lime. (20.) Decomposition of carbon-dioxide by green leaves in presence of sunlight: Place watercress in a bell jar containing water previously saturated with carbon-dioxide. Invert in a plate or trough of water, and collect bubbles of gas in a closed tube passed through the cork at the top of the jar. Test the gas collected with a glowing splinter.

Experiments with Water.—(1.) Put some rain-water, spring-water, and sea-water into three separate saucers, evaporate, and compare the residues. (2.) Heat some spring or sea water in a flask or retort, and allow the steam to pass through a tube into a cold vessel and condense. Compare the water thus obtained with the original liquid. *Composition of Water:*—(3.) Connect a flask containing water with an iron pipe at least a foot long, in which some iron turnings or pieces of magnesium ribbon have been placed. To the other end of the iron pipe fit a glass tube passing into a trough of water. Now heat the iron tube to redness over a Bunsen burner or Primus stove, boil the water in the flask, and collect the resulting gas over water. Test this gas with a lighted taper. Examine the iron turnings, and note any change in their appearance. (Caution: Remove the end of the leading-tube from the water before taking away the lamp from the flask.) (4.) Amalgamate a small piece of sodium with some mercury, and place the amalgam in a basin of water. Collect the gas produced in a test-tube or small bottle. Test the gas to see if it will burn. (5.) Generate hydrogen in quantity by means of zinc and hydrochloric or dilute sulphuric acid, and collect several bottles of the gas, taking care to first test a small quantity in a tube with a lighted match, to see that all air is expelled from the generating-bottle. (6.) Allow a jet of the gas to burn inside a cold bottle or bell jar. What do you observe on the sides of the vessel? (7.) Mix two parts of hydrogen with one of oxygen in a soda-water bottle, and two parts of hydrogen with one of nitrogen in another bottle. Apply a light to each. (8.) Pass a current of dry hydrogen through a heated glass bulb containing oxide of copper, connected with a U tube containing chloride of lime. Weigh the bulb and U tube both before and after the experiment, and notice the change in the appearance of the copper-oxide and chloride of lime. (9.) Decompose water by electricity in a voltameter, collect the gases in separate tubes, and test them.

Experiments with Hydrogen.—(1.) Insert a lighted taper in a jar of hydrogen, held mouth downwards. (2.) Pour hydrogen upwards into a jar of air. Test the gas in the upper jar with a lighted taper. (3.) Suspend an inverted beaker from one arm of a balance, and pour hydrogen upwards into it. (4.) Illustrate the lightness of hydrogen by means of a small balloon, or soap-bubbles filled with the gas.

Experiments with Ammonia.—(1.) Heat some flour in a test-tube with an equal quantity of quicklime, and note the effect of the fumes on (*a*) turmeric paper, (*b*) litmus paper, (*c*) a rod dipped in hydrochloric acid. (2.) Warm gently in a flask a mixture of ammonium-chloride or sulphate and slaked lime. Collect the gas by upward displacement, and test as in (1). Place a lighted taper in a bottle of the gas. (3.) Solubility of ammonia in water: Warm a small quantity of strong ammonia-solution in a flask till all air is expelled, fit the flask with a cork through which a nozzle passes, and invert it in a beaker containing a solution of red litmus. *Composition of Ammonia:*—(4.) Allow oxygen to bubble through a strong solution of ammonia in a small flask, and apply a light to the escaping gas. Hold a cold vessel over the flame, and notice whether moisture is deposited. (5.) Fill a long test-tube with chlorine over water, and invert it in a vessel containing ammonia-solution (half normal strength). When liquid ceases to rise in the tube, test the gas above it (*a*) with turmeric paper, (*b*) with a lighted taper. (6.) Formation of ammonia-salts: Allow ammonia gas (produced by heating the solution) to pass through (*a*) sulphuric, (*b*) hydrochloric acid, diluted with water, till all the acid is neutralised. Then evaporate the liquid. (7.) Test some of the salt produced in (6) by heating with slaked lime in a test-tube. (8.) Test for ammonia: Note the result produced when a few drops of Nessler's solution are added to water containing a trace of ammonia. Apply the same test to (*a*) rain-water, (*b*) river-water, (*c*) drain-water. (9.) Water a cabbage-plant with a solution of sulphate of ammonia (1 oz. to a gallon of water), applying the solution twice a week, and watch the effect on the foliage.

Experiments with Starch and Sugar.—*Test for Starch:*—(1.) Prepare a solution of iodine in potassium-iodide by adding a few grains of iodine to a strong solution of potassium-iodide, and allowing to stand till all the iodine is dissolved. Then add water till the fluid is of a dark-sherry colour. Wet a little starch so as to make a very thin cream, add boiling water, and boil in a test-tube for a few seconds. When cold add a drop of iodine-solution. A deep-blue colour will indicate the presence of starch. (2.) Starch in flour: Prepare some very thin paste with flour, and test for starch by adding a few drops of iodine-solution. (3.) Starch in bean-seed and potato-tuber: Scrape a portion of a softened bean-cotyledon or a potato-tuber into a basin, and test with the iodine-solution. *Test for Sugar:*—(4.) Prepare Fehling's solution in the following manner: Dissolve 35 grams of copper-sulphate in 500 c.c. of distilled water, and label "Solution A." Then dissolve 160 grams of caustic potash and 173 grams of sodium-potassium-tartrate (Rochelle salt) in 500 c.c. of water, and label "Solution B." When required for use mix equal quantities of A and B (only a small quantity, sufficient for immediate use, should be mixed each time). (5.) Place some glucose (grape-sugar) in a test-tube, dissolve in water, add a few drops of Fehling's solution, and then boil. A red deposit of cuprous oxide will be precipitated. (6.) Dissolve a few grains of cane-sugar in water, and test as in the last experiment. No precipitate will be formed if the cane-sugar is free from glucose. (7.) Conversion of cane-sugar into glucose: Make a solution of cane-sugar, and add to it a few drops of hydrochloric acid. Boil the liquid well, and then neutralise the acid with a weak solution of caustic potash or sodium-carbonate. Add Fehling's solution and boil again. Notice whether a red precipitate is formed. (8.) Conversion of starch into sugar by action of diastase: Having prepared some very thin starch paste, pour it when cool into three test-tubes, *a*, *b*, and *c*. To *a* add a few drops of iodine-solution, to show the presence of starch; to *b* and *c* add equal quantities of diastase-solution (made by dissolving a few grains of prepared diastase, obtainable from a chemist, in water). Test for the presence of starch in *b* by taking out small quantities at intervals of five minutes and adding iodine in a series of test-tubes. When *b* no longer shows traces of starch, test *c* for sugar with Fehling's solution. (Note: If prepared diastase is not procurable, add 5 gr. of malt to 50 c.c. of cold water; allow to stand for four hours; then filter.) (9.) Diastase in young seedlings: Pound up in a mortar about fifty young germinating barley seedlings. Make a weak starch paste, as in the last experiment, add a tablespoonful to the barley-plants. Leave in the dark, and test with iodine at intervals of a few hours, noting the gradual disappearance of the starch as it becomes converted into sugar.

Structure and Germination of Seeds.—(1.) Soak a pea or bean seed and a grain of wheat or maize in water for twenty-four hours. Notice in the former the testa, or outside covering, the embryo, consisting of radicle and plumule, and the two cotyledons. In the latter notice the embryo, with one cotyledon, the separate store of food (endosperm), and the scutellum, separating the embryo from the stored food. (2.) Notice the changed appearance of the seed-coats of bean-seeds after soaking for a short time. *Absorption of Moisture by Seeds:*—(3.) Take a number of bean-seeds, and paint half of them with enamel paint on the edge where the hilum (scar) and micropyle (small opening) are situated. Coat the rest of the beans with paint, so as to leave only these parts exposed. Weigh the two sets of beans separately, soak in water for some hours, and then weigh again, observing which set has absorbed more moisture. (4.) Soak and examine a number of different kinds of seeds, noting whether they contain one or two seed-leaves, and whether they have a separate store of food, as the wheat and maize have. (5.) Prepare a seed-bed, either in a box or in the garden, and sow in it as many different kinds of seeds as possible. Sow one or more seeds of each kind every two days, and when the last seed is well above ground pull up the whole set, examine the seeds and plants, and make drawings. Observe especially how the young plant emerges from the soil, the curves assumed by the stem, how the plant gets rid of the seed-coat, and any means provided for holding down the seed-coat while the leaves are being withdrawn. The following seeds are suggested for study: Pea, beans (various), cabbage, radish, marrow, pumpkin, oak, buckwheat, barley, wheat, maize, onion, castor-oil, date, nikau, and seeds of native forest-trees when obtainable. (6.) Conditions necessary for germination: Place some barley-seeds (*a*) in a dry saucer in a warm place; (*b*) in a moist earthenware vessel, or on damp flannel in a warm place, exposed to light; (*c*) as in (*b*), but protected from light, allowing, however, free access of air; (*d*) in a bottle of previously boiled water, tightly corked, and placed in the dark; (*e*) as in (*c*), but in a cold place. After a few days compare the results. (7.) Production of carbon-dioxide during germination: Allow seeds to germinate in a closed bottle, and then test the gas in the bottle (*a*) by introducing a lighted taper, (*b*) by means of lime-water. Is there any alteration in the appearance of the seeds as the plants grow? (8.) Increase in temperature during germination: Fill a beaker with moistened seeds and another with moistened sand. Place a thermometer in each so that the bulb is well covered, and allow the vessels to stand side by side in a warm situation, noting any difference in temperature. (9.) Increase in size of seeds when moistened: Fill a common bottle with pea, bean, or barley seeds, pack tightly, add water enough to moisten them, and cork the bottle securely. Put the bottle in a warm place, and cover with a box. (10.) Changes in stored food during germination: Notice the difference in taste between germinated and ungerminated barley-seeds. (11.) Dry crushed barley and malt in an oven; weigh out equal quantities of each, and then add twenty times their weight of water. The mixtures should be left for several hours, shaken at intervals, and then filtered, after which the residues should be dried and their weights compared. What causes the difference in weight? (12.) Testing vitality of seeds: Take an equal number of new, one-year-old, and two-year-old seeds of the same kind, and place them between damp flannel in earthenware saucers to germinate. Inspect the saucers day by day, removing germinated seeds, and at the end of two weeks calculate the percentage of germinating seeds in each sample. (13.) Test samples of various commercial seeds as in the preceding experiment, and ascertain the proportion of good seeds. (14.) Depth at which seeds germinate best: In a box of prepared soil sow pea, bean, oat, or other seeds at various depths. Provide suitable conditions for germination, and note the dates on which the plants appear, and their comparative vigour. (15.) Dispersal of seeds: Make a collection of seeds and fruits, which may be mounted on cards, classifying them in the following manner: (*a*) Seeds dispersed by expulsive mechanism (*e.g.*, gorse, balsam, broom, &c.): (*b*) seeds and fruits which creep or hop along the ground (*e.g.*, fruits of some grasses, seeds of some scabiouses): (*c*) seeds and fruits carried by the wind—(1) those provided with wings (*e.g.*, elm, pine, sycamore, birch, parsnip, ash); (2) those which have feathery parachutes or pappi (*e.g.*, dandelion, thistle): (*d*) seeds of berries and fleshy fruits, carried by birds (*e.g.*, cherries, blackberries, raspberries): (*e*) seeds and fruits bearing hooks or spines (*e.g.*, burr, Uncinia, &c.): (*f*) seeds of sticky fruits (*e.g.*, Salvia, mapau (Pittosporum): (*g*) fruits and seeds carried by water (*e.g.*, cocoanut and other tropical fruits and seeds; seeds of aquatic plants, such as water-lily).

Experiments with Roots.—(1.) Roots of young plants; comparison between roots of mono- and di-cotyledons: Examine young plants of pea, bean, barley, oats, &c., and observe the difference between the roots of plants with one seed-leaf and those with two. (2.) Root-hairs: Allow some barley or radish seeds to germinate on damp blotting-paper in a saucer, and examine the roots with a lens from time to time. Make sketches of several seedlings of different ages, showing the exact position of root-hairs. (3.) Root-caps: Suitable specimens for examination are —Aerial roots of screw-pine, pea and bean seedlings, roots of some water-plants (*e.g.*, duckweed), as well as roots of cuttings grown in water. Hold delicate specimens up to the light and examine with a lens. (4.) Growth of roots: Notice the roots of a full-grown monocotyledonous plant, such as wheat, maize, or any grass Compare these with the branching roots of a dicotyledonous plant, such as a forest-tree, observing the increase in thickness of the main roots in the latter. (5.) Increase in length: On the root of a young bean-seedling make a number of marks in ink at regular intervals, making at the same time corresponding marks on a piece of card laid alongside. Now place the seedling in a damp atmosphere, root downwards, and allow it to grow. After a day or two again look at the plant, and ascertain the region of greatest growth by comparing the marks on the root with the marks on the card. The seed may conveniently be wrapped in moist cotton-wool, and placed in a thistle funnel standing in a beaker, the root being allowed to grow down the tube. (6.) Primary and secondary roots: Slice the main roots of a broad-bean seedling, and notice where the secondary roots originate. Cut a longitudinal section of a carrot, and trace the roots through the "rind" to the "core." (7.) Influence of gravitation on roots: Place bean-seeds, with roots about an inch long, in a damp atmosphere, allowing the roots to point in various directions. Examine the specimens from time to time, and note the direction taken by the tips of the roots. (8.) Influence of water on roots: Sow some peas in a sieve (or a conical bag of mosquito-netting suspended from a retort-stand ring) filled with damp sawdust. When the roots project through the meshes notice whether they grow downwards vertically or along the bottom of the sieve or bag. (9.) Behaviour of roots towards light: Grow an aquatic plant (*e.g.*, watercress) in a tumbler of water, and place round the tumbler a mask of black paper with a slit in one side to admit light. Also cover the top of the tumbler with a card. Now place the vessel in a window, with the slit towards the light, and in a few days observe whether the roots have turned towards or away from the slit. (10.) Absorption by roots: Fill two small bottles with water, adding to one a few drops of red ink or eosine, and to the other a little carmine worked up into a paste. In each bottle place a young seedling, so that its roots are immersed in the water, securing the plants by packing the necks of the bottles with cotton-wool. After a few days wash the seedlings and cut them lengthwise and across, noticing which plant has become red inside, the one placed in the soluble eosine or that in the insoluble carmine. (11.) Over the ends of two thistle funnels tie tightly pieces of bladder. In one funnel place coloured water containing sugar in solution, and stand it bulb downwards in a beaker of water. Into the other funnel pour clean water, and stand it in a beaker containing sugar-solution. After a time observe whether the liquid in the funnel-tubes has risen or fallen. (12.) Action of roots on rocks: Allow seedlings to grow in sawdust or sand on a polished marble slab, so that their roots spread over its surface. After a couple of months have elapsed remove the plants and examine the surface of the slab. (Note: Tilt the slab slightly, and do not grow too many seedlings.) (13.) Exudation of acid by roots: Pull up some plants, and lay moist blue litmus paper on their roots.

Experiments with Stems.—(1.) Gather and examine specimens of plants with the following types of stems: (*a*) Upright woody stems; (*b*) upright non-woody or herbaceous stems—*e.g.*, sunflower, balsam, potato, grasses, &c.; (*c*) stems of climbing plants—*e.g.*, pea, Virginia creeper, ivy; (*d*) twining stems—*e.g.*, convolvulus, hop, scarlet-runner; (*e*) creeping stems—*e.g.*, couch-grass, verbena, strawberry; (*f*) underground stems—*e.g.*, iris, potato, Solomon's seal, rhizomes of ferns. In examining the stems the following points should be noticed: (i) The nodes and internodes, observing the length of the latter in different parts of the stem; (ii) the arrangement of leaves, which are so placed as not to shade each other (in the case of a plant like the privet notice the difference between the position of leaves on an upright shoot and that of leaves on a horizontal branch); (iii) in the case of twining stems notice the direction taken by the growing tip, whether from right to left or the opposite. (2.) Internal structure: Examine sections (both transverse and longitudinal) of stems of monocotyledonous plants such as maize, nikau palm, bamboo, or cane, and dicotyledonous trees such as oak, pine, &c., and notice the differences of structure. In the former note (*a*) the absence of a central core of pith, (*b*) the hard fibrous strands and soft surrounding tissue, (*c*) the hard outer rind; in the latter observe (*a*) the pith, (*b*) the annual rings, (*c*) the medullary rays, (*d*) the thick bark. If sections of old trees are available, determine their age by counting the annual rings. (3.) Storage of food in underground stems: Examine the underground stems of the iris and Solomon's seal, the tubers of the artichoke and potato, and the corm of the gladiolus or crocus. Test these for starch by means of iodine-solution, and, if possible, microscopic sections. (4.) Compare new potato-tubers and those exhausted by sprouting. (5.) Conveyance of sap by stems: Water a well-developed sunflower or tomato-plant growing in a pot, and place it in a warm shaded situation for an hour. Then cut off the stem, and fasten a glass tube to the stump by means of a rubber tube. Now pour in a little water, tap the tube to displace air-bubbles, and mark the height at which the water stands in the tube. After a time notice the difference in height of the liquid in the tube. (6.) Healing of wounds: Examine places on trees where branches have been cut or broken off, and notice how the plant has endeavoured to repair the damage. Observe the difference between the results where branches have been cut off close to the stem, and where the branches have been allowed to project some distance beyond the bark. Make drawings of such cases.

Experiments with Leaves.—(1.) Collect, mount on cards, and describe leaves of various shapes. Make drawings of typical leaves. (2.) Collect as many leaves as possible of the following classes, and try to account for their forms: (*a*) Thick, fleshy leaves; (*b*) leaves protected by means of spikes; (*c*) hairy leaves, or leaves covered with scales; (*d*) early and mature leaves of plants which show marked differences; (*e*) lop-sided leaves. (3.) Look for leaves which are modified so as to act as climbing-organs. (4.) Relation of foliage-leaves to absorbent roots: Observe during rain, or while watering with a can, the direction taken by the water falling on various plants. Where practicable, examine the roots also. Trace the course of small shot poured over plants. Examine leaf-stalks of rhubarb, beetroot, violet, &c., for grooves to convey moisture to root. *Structure of Leaves*:—(5.) Veins of leaves: Try to procure "skeleton" leaves from the heaps of decaying leaves in damp places. (6.) Boil some stiff leaves for fifteen minutes in a solution of caustic potash—1 part of potash by weight to 20 of water. Then place the leaves in a dish of water, and gently brush away the soft parts with a camel's-hair brush. (7.) Compare the arrangement of veins in mono- and di-cotyledonous plants. *Microscopic Structure of Leaf*:—(8.) Strip off a portion of the epidermis on the under-side of a lily, hyacinth, or daffodil leaf, mount in water, and examine under the microscope for stomata. Examine the skin of the upper side of the leaf in the same way, and compare the number of pores. (9.) Cut a thin section of a leaf, and examine for grains of chlorophyll. *Functions of Leaves*:—(10.) Transpiration: Enclose a straight leaf, still attached to the plant, in a test-tube, and close the end of the tube with a split cork without injuring the leaf. Notice that moisture collects inside the tube. (11.) Place against the upper and lower surfaces of a leaf a sheet of filter-paper which has been dipped in cobalt-chloride and dried. Notice which piece of paper changes colour first. (Note: Cobalt-chloride always turns pink in the presence of moisture.) (12.) Cover two tumblers containing water with pieces of card. Through holes in the cards pass the cut ends of leafy shoots, so that they dip into the water. Block the holes with wax, and cover the shoots with tumblers. Now place one set in the light in a window, and the other in a dull situation, and observe which of the upper tumblers becomes bedewed more rapidly. (13.) The breathing of plants: Place in a wide-mouthed bottle a handful of tips of leafy shoots, with a little moisture to keep them fresh. Put away in the dark for about six hours, and then test with lime-water for carbonic dioxide. (14.) Repeat the last experiment, placing the jar in bright sunlight, and test again for carbonic dioxide. (15.) Inhalation of carbonic dioxide and exhalation of oxygen by leaves: Place some watercress-leaves (*a*) in water, through which carbonic dioxide has bubbled, in a dark place; (*b*) as in (*a*), but in bright sunlight; (*c*) in previously boiled water in bright sunlight. Collect the gas given off in (*b*) by means of a funnel and test-tube, and then test with a glowing splinter. Always be sure that no bubbles of air are entrapped amongst the watercress before commencing the experiment. *Formation of Starch in Leaves*:—(16.) Early in the morning gather some leaves (*e.g.*, nasturtium or fuchsia), and test them for starch as follows: (i) Dip into boiling water; (ii) soak in hot alcohol to remove chlorophyll; (iii) place in a solution of iodine. After the sun has shone for a few hours gather more leaves from the same plants, and test again. A greenish-brown stain will denote the presence of starch. (17.) Cover a portion of a leaf attached to a plant with black paper, sticking-plaster, or cork on both sides, overnight or early in the morning. When the sun has shone brightly on the plant for some hours, remove the leaf and test for starch as in the last experiment. (18.) Test a variegated geranium or white and green leaf for starch, after the sun has shone on it for a considerable time. (19.) Late in the afternoon of a bright day examine the stomata of a leaf under a fairly high power of the microscope, and observe the starch-granules in the guard-cells. Run a drop of iodine under the cover, and watch the effect on the starch-grains. (20.) Rub into a paste with a little water a number of nasturtium or pea leaves gathered during the night, and add this liquid to a thin starch paste. Keep warm, and after a few hours test for starch and sugar. *Protection afforded by Scale Leaves*:—(21.) Examine buds of different plants, also the corms of the crocus and gladiolus, the tubers of the Jerusalem artichoke, and the rhizomes of the Solomon's seal, and observe the way in which they are protected by scale leaves. *Effect of Light on Leaves*:—(22.) Leave a pot containing a young nasturtium-plant for a few hours at some distance from a window, and then observe the position of the leaves. Notice the effect of light on the leaves of plants placed in a window. *Leaf-sleep*:—(23.) Note the night position of leaves of the clover and wood-sorrel, and compare with the day position.

Experiments with Flowers and Fruits.—(1.) Examine as many as possible of the following flowers—tulip, lilies, buttercup, wallflower, anemone, primrose, fuchsia, geranium, pea, cucumber, pumpkin, marrow, willow, pine—also flowers of any native trees within reach. Look for the sepals, petals, stamens, pistil, and ovary in the specimens examined. Note which plants have the pistil and stamens in the same flower, and which in separate blossoms. Try to discover as many trees as possible which have the male blossoms on one tree and the female on another. (2.) Examine the flowers of wheat, barley, maize, oats, and grasses of various kinds, noting the pistils, stamens, and the scaly structures which take the place of petals. (3.) Dissect and examine composite flowers, such as the sunflower, daisy, groundsel, cornflower, &c. Distinguish between the showy portion designed for advertising purposes and the less conspicuous part which contains the essential organs. *Pollination and Fertilisation of Flowers*:—(4.) Examine pollen-grains of various flowers under a lens or microscope, and note their forms. (5.) Make a 3-per-cent., 5-per-cent., and 10-per-cent. solution of cane-sugar. Place some in separate watch-glasses, and shake into them various kinds of pollen-grains, cover, and allow them to remain in the dark in a warm room. Place them under a microscope after twelve or eighteen hours, noting whether pollen-tubes have been produced; or crush the mature stigmas of some lilies, place the material in a watch-glass, and sprinkle pollen-grains in the glass, proceeding as above. (6.) Tie up in paper bags two pistillate flowers of a cucumber, marrow, or pumpkin before they reach maturity. When the blossoms are ready, gently touch the stigma of one with a ripe anther from a staminate blossom, so that some pollen is deposited, and then replace the bag. Notice which flower produces ripe fruit. (7.) Withering of blossoms after fertilisation: Observe a flower-head of clover, and notice the change that takes place in the florets after fertilisation. (8.) Try experiments in cross-fertilisation with plants of the same kind, but possessing well-marked differences of colour (*e.g.*, primrose, dianthus, begonia). In the case of plants bearing complete flowers the anthers should be removed from the flower to be pollinated before they reach maturity. Care should be taken to keep away insects by covering the blossom operated on with a bag. A fine camel's-hair brush is a suitable instrument for conveying the pollen. Plants should be raised from the resulting seeds the following season, and their flowers compared with those of the parent plants. (9.) Classify the plants of your acquaintance according to their method of pollination: (*a*) Self-pollinated; (*b*) wind-pollinated; (*c*) pollinated by birds; (*d*) pollinated by insects.

III. NOTES ON AGRICULTURE FOR PRIMARY SCHOOLS IN THE NORTH CANTERBURY EDUCATION DISTRICT.

In offering the following brief notes it is not to be supposed that other methods of treatment are to be avoided—indeed, it is hoped that the courses outlined in these pages will be viewed in the light of suggestions rather than directions, and that teachers will depend on their own efforts for a supply of working-details. Amongst the factors which determine the special work to be undertaken the most important perhaps are the conditions and surroundings of the school. These, therefore, to a large extent must always influence the selections made. The courses are intended to supply material from which a three-years programme may be prepared in country and suburban schools—*i.e.*, schools whose conditions admit of the work being undertaken and carried out in such a way as to furnish a training in what is popularly known as "elementary scientific method." To this end it is essential that the work be not hurried, and that the facts to be learned be gathered by the pupils themselves from experiment, from investigation, and from independent observation. Throughout the courses the heuristic method must be freely used, and the oft-repeated platitude remembered that the value of the subject lies not so much in the information acquired as in the spirit of the teaching. It is only by realising what this means that the best results can be secured. In schools where the three upper classes are taught by separate teachers, Part I will form a first year's course, Part II a second year's course, and Part III a third year's course, though programmes analogous to those outlined may be substituted. The amount of work covered from year to year will depend largely on the treatment employed. In schools where the three upper classes are grouped for instruction, it will probably be found desirable to deal with Part I (or as much of it as can be undertaken) as the basis of a first year's course; for a second year's course to repeat some of the portions from Part I prior to entering on the new work; and for a third year's course to revise certain portions from Parts I and II before dealing with the final stages. In schools where staffing arrangements other than those referred to obtain, the work can be divided as occasion demands. Though drawn up with special reference to the upper classes, there is no reason why the more elementary parts of the programme should not be dealt with in the nature-study of the lower forms. It is highly desirable that, in addition to the work done inside the school—and much of that detailed in these suggestions lends itself to this treatment—a definite amount of practical gardening be overtaken as well. If the classes wish to earn a grant under the regulations for manual and technical instruction each pupil must give to individual practice at least half the total time devoted to instruction. It will probably be found convenient to arrange the courses so that the greater part of the outdoor work may receive attention during those parts of the year when the weather is most favourable for outdoor occupation. Where classes are combined for instruction, the proposed courses must be plotted out at the beginning of he school year, and submitted to the Inspector for his approval at his first visit after the year has begun.

PART I.—(1.) Parts of plants—root, stem, branches, leaves, flowers, and fruit. (2.) Fertilisation of flowers and formation of seed; development of fruit and distribution of seed; storage of food in seed, stem, and root; germination—conditions essential to promote this—moisture, air, and warmth. (3.) Composition of plants: Organic and inorganic matter; elements and compounds; chemistry of air and water; and chief properties of oxygen, hydrogen, nitrogen, carbon-dioxide, and ammonia, as bearing on plant-life. (4.) How plants feed: Food obtained from the soil, action of roots and root-hairs; importance of water to plants; process of osmosis; transpiration. Food obtained from the air; function of the leaf, decomposition of carbonic dioxide; chlorophyll; formation of starch. (5.) The soil: How formed; weathering of rocks; action of air, water, and plants; formation of humus; importance of earthworm; plant-food in soil; sand and clay; physical conditions; power of retaining plant-food; characteristics of different soils. (6.) Life-history of one or more insects.

Experimental Work bearing on Part I.—Most of section I will already have been overtaken by pupils before reaching Standard IV. Make sketches where possible of the various parts of the plants. Note where branches and leaves are most numerous. Why do leaves grow towards ends of branches and at top of trees? Why do lower branches extend further out from trunk than those higher up? Examine several flowers in detail—*e.g.*, buttercup, wallflower, sweet-pea—and gradually become familiar with the terminology applied to the various parts of flowers. Remove parts, and sketch where possible. Observe bees visiting flowers; where do they alight in each case, and what attracts them? Notice some flowers—*e.g.*, those of grasses—which have little or nothing to attract; how are these fertilised? Seeds are distributed chiefly by (*a*) wind, (*b*) water, (*c*) animals, and (*d*) by some explosive apparatus. Examine for (*a*) seeds of ash, elm, sycamore, thistle, dandelion, clematis; for (*b*) fruit of water-lily enclosing seeds, seeds of sedges; for (*c*) "burrs" of various kinds (piri-piri) "bid-a-bid," as examples of seeds furnished with hooks; also fleshy fruits of various kinds—*e.g.*, blackberries, currants, cherries. For (*d*) note the bursting of gorse-pods in the hot weather. Note arrangement of seeds in capsule of poppy; how are these distributed? Take small quantity of starch (half a teaspoonful), drop into about half a pint of boiling water, allow to cool, and add few drops of iodine-solution—liquid becomes a deep blue. Examine (*a*) seeds of broad-bean, garden-pea, scarlet-runner, &c.; also (*b*) wheat, oat, and maize grains. Soak in water for a few hours and note in (*a*) seed-covering, two cotyledons, and plantlet; and in (*b*) covering, embryo, and store of food separated from embryo by scutellum. In (*a*) food is stored in cotyledons; in (*b*) in one end of fruit and away from embryo. Test for starch in all seeds and grain examined. Examine potato, onion, crocus, iris, &c., for storage of food in stems; and carrot, turnip, mangold, &c., for storage of food in roots. Germinate bean and pea seeds, also maize and wheat grains, by placing in damp sawdust or between pieces of damp flannel; observe from time to time, and note the various steps in process. Sketch appearance of seed or grain from day to day. Note difference in modes of growth of the two types of plants. Take four pickle-bottles, A, B, C, and D, and operate with same seeds in each. Place seeds in A, cork and seal up securely. In B place a few layers of blotting-paper, moisten, drop in seeds, cork, and seal as before. Treat C as B, but leave bottle uncorked, and moisten blotting-paper from time to time. Boil some water (to remove air), allow this to cool, and with it fill up D, drop in seeds, cork, and seal up. Arrange bottles side by side in dark place, and examine daily. If experiment is successful, seeds in A should not germinate at all; in B seeds will germinate and go on growing until air be exhausted; in C germination and growth will be carried on vigorously; and in D very little growth will be observed. Cover two lots of seeds with damp sawdust, and place one lot in cool and one lot in warm atmosphere; note results. Fit up small box with glass front, fill with fine moist soil; bury seeds to various depths, being careful to place them against glass so that process of germination and growth can be observed. Note results, and determine most suitable depths for various kinds of seed. Take a plant of convenient size, weigh carefully; heat strongly in a metal vessel for some time, weigh again. The organic matter has been driven off; difference in weight will represent inorganic or mineral matter in plant. Place some garden-mould over a strong flame and raise to red heat, weighing carefully before and after operation; as in former experiment organic matter will be driven off and inorganic matter left. The terms "elements" and "compounds" may here be illustrated and explained. Prepare oxygen from chlorate of potash and manganese-dioxide, hydrogen from granulated zinc and hydrochloric or sulphuric acid, carbon-dioxide from marble and some acid, and ammonia from ammonium-chloride and lime, and ascertain by experiment properties of these gases. For details of preparation consult some work on elementary chemistry. Remove oxygen from air by burning phosphorus on water under a closed bell jar, and ascertain proportions of oxygen and nitrogen in air. Here again it may be necessary to refer to some work on elementary chemistry. Obtain a tumbler of lime-water and breathe into it through a piece of fine glass tubing; liquid quickly turns milky in appearance owing to presence of carbonate of lime; carbonic dioxide expelled from lungs has united with lime in water to form carbonate of lime or chalk. Expose to air some lime-water in a saucer; at end of a few hours surface will be covered with a thin film of carbonate of lime. Where has the carbonic dioxide come from? Burn a candle in closed bottle; observe that flame soon goes out; why? Pour in some lime-water; shake up; note results. Germinate some seeds in a bottle, and ascertain that carbonic dioxide is given off. Take two bottles, A and B, and fill with water; into A pour small quantity of red ink or eosin solution; into B drop some pieces of carmine or some black ironsand. Place a small rooted plant in each bottle. At the end of a few hours remove plants, cut the stem and branches across at various heights from the roots and note the results. (1) The solid matter must be dissolved before it can be absorbed; (2) the solution travels up through the woody part of stem. Cut the end off a potato-tuber so as to form a base on which it will stand; hollow out the tuber, half fill it with water in which some sugar has been dissolved, and place it in an upright position in a vessel containing water; note the rise of the liquid inside the tuber. Reverse the process, placing the sugar-solution in the vessel and the pure water in the tuber, and note the result; in each case the lighter liquid will pass into the denser. Insert through cork of pickle-bottle a stem bearing leaves, allowing the cut end of stem to enter the water in bottle. Fit a piece of cardboard over neck of bottle, and allow a tumbler to rest on this so as to cover the stem. Place the whole in the sunlight, and note the drops of water collecting on the inner surface of the tumbler. Fit a leaf carefully into an air-tight cork of pickle-bottle, and allow end of leaf to enter water in bottle. Insert through the cork a small piece of glass tubing bent once at right angles; this must not reach the water. Apply lips to tube and exhaust the air over the water. Note bubbles of air arising from end of leaf-stalk. Place bunch of watercress in vessel of water charged with carbonic dioxide, cover with inverted funnel, the smaller end of which must be below the surface of the water; fill narrow test-tube with water and invert it over neck of funnel; expose whole to sunlight for some hours; test the gas which has collected in test-tube by inserting glowing splinter, and ascertain that it is oxygen. Repeat experiment, but place whole in dark; note result. Boil a leaf for a few minutes in water, then immerse it in alcohol for some time; note colour of the liquid. Remove it from liquid, wash well, and place in weak solution of iodine; note bluish colour, showing presence of starch. Cover portion of leaf of growing plant with tinfoil or cork for day or two; apply starch test and note result. Experiments may also be made to show that presence of carbonic dioxide is necessary for formation of starch. Notice weathering of rocks and gradual formation of soil. Explain and illustrate, as far as possible, action of heat and cold, air, water, and plants, and work done by earthworms. Ascertain by experiments the properties of sand and clay—*e.g.*, sand is composed of small angular grains, will not bind together, and is unable to hold moisture. Clay consists of exceedingly fine particles, which readily bind when wet; in this condition is compact and feels smooth and greasy; when saturated is impermeable to water, and retains moisture for a long time. Work out the life-history of one or more insects. Make a collection of the insect pests found in the neighbourhood. In what ways are these most readily destroyed or kept in check?

Part II.—(1.) Brief outline of the chemistry of the chief elements essential to plant-growth; influence of light, warmth, and moisture in stimulating growth; bacteria as the cause of the decay of organic substances in the soil; nitrification generally, and with special reference to leguminous plants. (2.) Mechanical analysis of soils; classification of soils; good and bad qualities of soils; influence of mechanical condition on soil's fertility; plant-food in the soil; chemical composition of chief articles of plant-food; available and dormant plant-food. (3.) Tillage: Objects of tillage; improvement in mechanical conditions of the soil; promotion of chemical changes brought about through exposure to air (fallowing); economy of manure; capillary action in soils. Drainage, benefits of; drainage-water a possible source of loss of plant-food. Autumn cultivation. (4.) Bird-life of the district; native birds; introduced birds. Their habits, and uses in destroying insect pests.

Experimental Work bearing on Part II.—Investigate properties of oxygen, hydrogen, nitrogen, carbon, sulphur, phosphorus, iron, potassium, sodium, chlorine, with special reference to the forms in which they occur in nature. For particulars consult some work on elementary chemistry or agriculture. Provide two or more boxes of seedlings. These should be grown in boxes 4 in. to 6 in. deep; from one of the boxes exclude the light completely; over another box place a piece of red glass; over a third a piece of blue glass; stand the whole in a sunny place, water as required, and note the results day by day. By admitting light only through certain places in sides or top of box other experiments may be made. Make a mechanical analysis of some garden-soil (see syllabus regulation 56), and calculate percentage of sand and clay it contains. Make further analysis of other samples from the district, and gradually work out classification of soils—*e.g.*, sandy soil, sandy loam, loamy soil, clay-loam, clay. Ascertain if soil contains an appreciable quantity of chalk, by first drying and then testing with acid. In each of two vessels similar in size and shape place an equal weight of soil; press the surface of one firmly down, and stir that of the other from time to time so as to keep the top loose and open; place both in an airy place, and weigh from time to time to ascertain the rapidity with which each loses moisture. Illustrate by experiment the combination of elements to form compounds—*e.g.*, heat some sulphur and iron-filings, and convert these into the compound sulphide of iron. Illustrate by experiment the combination of an acid and a base to form a salt—*e.g.*, dissolve small quantity of barium-chloride in water, add a few drops of dilute sulphuric acid, and obtain the insoluble salt barium-sulphate. Pour water containing carbonic dioxide in solution into some lime-water, and obtain the salt carbonate of lime. Make experiments with blotting-paper, lamp-wick, flannel, chalk, sugar, &c., to illustrate capillarity. Take two small pieces of glass (three or four inches square) and stand upright in a saucer of coloured water; bring their edges together along one side and notice the distribution of the water over the plates, the level being highest where the space between the plates is least, and lowest where the space is greatest. Fill some lamp-chimneys with various kinds of soil, place them upright in water to the same depth, and note the different levels to which the water rises in each. By taking equal weights of various soils and testing under similar conditions, the percentage of water absorbed by each as the result of capillary action can be calculated. Grow seeds in the same kind of soil, but reduced to different degrees of fineness, and note results. Examine a tuft of cocksfoot or other suitable grass, and note its manner of rooting and flowering. Make out the flowering-stem, nodes, internodes, leaf (sheath, blade, and ligule), spikelet. Make a collection of the more common indigenous and introduced grasses in the neighbourhood.

Part III.—(1.) Soil-exhaustion—remedies: rotation of crops, fallowing, manuring. (2.) The object of manuring; general and special manures; farm-yard manure, factors determining its value, its liability to ferment, management to prevent loss; position of organic matter in soils, and the action of farm-yard manure; vegetable and animal refuse as manures; green manures; artificial manures; methods of use of the various nitrogenous, phosphatic, and potassic manures; mineral manures. Action of lime on the soil, its direct and indirect effects. (3.) Characteristics of common crops: Cereals, root-crops, and fodder-crops. Principles of adaptation of manures to crops. (4.) Importance of good seed-bed; propagation of plants by cuttings, tubers, bulbs. Objects of grafting and pruning.

Experimental Work bearing on Part III.—Take two pots filled with sawdust, and in each plant, say, half a dozen seeds at a suitable depth; moisten one regularly with water, and the other with a solution containing the essentials for plant-growth. Note the effect of supplying the plant with food. Spray some potatoes with Bordeaux mixture, and leave some unsprayed. To make Bordeaux mixture, dissolve 1 lb. of bluestone either by pouring boiling water on the crystals or by suspending these in a bag in cold water; add water sufficient to make up to ten gallons when the lime is mixed with it; slake 1 lb. of fresh lime, and when thoroughly mixed strain into the copper-solution and stir up thoroughly. This mixture should be used within a few days, or it will deteriorate. To make the mixture adhere better to the foliage, 1 lb. of treacle should be mixed with it. The potatoes should be sprayed twice or three times at intervals, and to be effective should be treated before any sign of blight appears. Procure some seed oats or barley infected with smut, dress some with formalin (1 oz. to 3 gals. of water), some with bluestone (2 oz. to 1 gal. of water), and leave some untreated. Sow plots or rows of each of these, and note results. Grow cuttings of gooseberries and currants; and carry out grafting, budding, and pruning operations. Grow in school gardens, cereals, potatoes, peas, turnips, &c., with and without manure, and with different kinds and quantities of manure. For instance, potatoes may be chosen for experiment, and a plot or row planted with applications of the following manures: (1) Superphosphate, sulphate of ammonia, kainit; (2) sulphate of ammonia, kainit; (3) superphosphate, kainit; (4) superphosphate, sulphate of ammonia; (5) no manure; (6) farmyard manure. This supplies a plot with the three necessary manurial ingredients, one with each of them omitted, and one with no manure for a control experiment. Similar experiments may be made with peas, and should prove that nitrogenous manures are not necessary. Experiment also with lime in various plots. The following quantities are given to aid in calculating the amount necessary to equal a given quantity per acre:

With rows 2 ft. apart, 2 oz. to 10 ft. = 2½ cwt. per acre.; 1 lb. applied to 40 square yards = 1 cwt. per acre; ⅖ oz. applied to 1 square yard = 1 cwt. per acre; lime or manure, 8 oz. applied to 1 square yard = 1 ton per acre.

SCHOOL GARDENING.—In laying out a new garden care must be taken to obtain the most suitable piece of land available. It should be situated so that there is sufficient fall for good drainage, and be well sheltered without being too near the roots or shade of large trees. If the land is poor in quality it will lend itself all the better to the manurial experiments. In preparing the ground it should be dug over in autumn or early winter, and left exposed to the weather. If the subsoil is stiff or hard it should be broken at the same time, but not brought up to the surface. After the winter the ground should be found mellow and friable, and should easily be worked down with spade, fork, or rake into a good seed-bed in the spring. The size of the plots and the number of children to work at each plot will depend very largely on the amount of land available for the school garden, but a convenient size of plot is 33 ft. by 11 ft. for, say, two pupils, and the ground should be measured off into regular plots of the size found suitable. Plots should not be very wide, so that they can be hoed and weeded from the paths. Pupils should be taught to keep all tools clean, and to put them carefully in their places when not in use; all handles should be oiled occasionally to prevent them from cracking, and also to make them much more pleasant to use. The first year's work will consist chiefly in the preparation and laying-out of the ground, and in growing ordinary farm and garden crops, such as wheat, barley, oats, potatoes, peas, beans, cabbage, turnips, mangolds, &c. A beginning may be made in the work of seed-selection to ascertain if the quality of the grain grown can be improved by carefully sowing the best seeds. Plots may be laid out to grow the same crops in succession for several years, and plots of useful grasses established to test their permanence. Experiments may be made with manures and with lime. The work in the following years will be similar to that undertaken in the first. The work in hand will be continued and further manurial experiments made, with perhaps some variation based on experience already gained. An interesting addition to the work would be an experimental plot where efforts could be made to acclimatise useful plants from other places. Gooseberry and currant bushes should be grown to provide material for cuttings, and grafting and budding may be taught. Throughout the whole of the work pupils should be trained to observe and note the different operations carried out, and to keep accurate records of the results of the experimental work.

GARDEN TOOLS.—A set of tools will consist of 2 spades, 2 digging-forks, 2 Dutch hoes, 2 hoes, 2 steel rakes, 2 garden-lines, 1 watering-can, 6 hand-forks, for each ten or twelve pupils.

APPARATUS AND MATERIALS REQUIRED.—1 chemical balance; 1 test-tube stand; 1 stand with clamp and universal joint; 1 tripod; 1 pipeclay triangle; 1 piece wire gauze; 1 spirit-lamp; 1 pneumatic trough; 1 bee-hive stand; ½ dozen gas-collecting jars or pickle-bottles; 1 dozen test-tubes; 3 boiling-tubes; 2 small flasks; 2 measuring-glasses; 2 thistle funnels; 2 filter funnels; 1 bell jar; 1 lb. glass tubing; 1 yard rubber tubing; 2 dozen corks; 100 filter-papers; 1 deflagrating-spoon; 6 oz. chlorate of potash; 4 oz. manganese-dioxide; 6 oz. granulated zinc; 6 oz. lime; 6 oz. ammonium-chloride; 8 oz. carbonate of lime; 2 oz. phosphorus; 2oz. sodium; 2 oz. potassium; 2 oz. barium-chloride; 1 oz. iodine; 1 oz. potassium-iodide; 2 oz. carmine; 1 lb. sulphuric acid; 1 bottle eosin tabloids; 1 bottle methylated spirits.

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