SESSIONAL PAPERS.

VOL. XIX.—PART V.

FIRST SESSION OF THE SIXTH LEGISLATURE.

OF THE

PROVINCE OF ONTARIO.

SESSION 1887.

Toronto:
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1887.

LIST OF SESSIONAL PAPERS

ARRANGED ALPHABETICALLY.

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Asylums, Report	3	*Printed.*
Births, Marriages and Deaths, Report	2	*Printed.*
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Bonds and Securities	65	*Not printed.*
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No. 23.. Report on the School Appliances, Pupils Work, etc., exhibited by the Education Department of Ontario at the Colonial and Indian Exhibition, London, England, in 1886. (*Printed.*)

No. 24.. Report of the University of Toronto for the year 1885-6. (*Not printed.*)

No. 25.. Report of the Inspector of the Elgin House of Industry and Refuge for the year ending 31st October, 1886. (*Not printed.*)

No. 26.. Statement of the affairs of the Toronto General Trusts Company. (*Not printed.*)

No. 27.. Return of the Municipal Council of the Township of Yarmouth, of money borrowed during the year 1886, under the Act respecting the investments in Tile Drainage. (*Not printed.*)

No. 28.. Copies of Advertisements, Tenders, Specifications, Contracts, etc., in connection with the erection of the proposed Legislative and Departmental Buildings of Ontario. (*Printed.*)

No. 29.. Return to an Address to His Honour the Lieutenant-Governor, praying that he will, in his capacity as visitor of the Western University of London, Ontario, call upon the Senate of said University to furnish a full and accurate account of the property of the University, and the income received therefrom, in order that the same may be laid before the Legislature, as directed by section 5, of 41 Vic., cap. 20. (*Not printed.*)

No. 30.. Return shewing the total number of Students in University College at the date of the Order ; the number of female students at the same date, and also, the number of students attending lectures in each of the following subjects :— Greek, Latin, Mathematics, Pyhsics, History, Ethnology, English, French, German, Italian, Spanish, Hebrew, Chaldic, Syriac, Logic, Mental and Moral Science, Biology, Chemistry, Mineralogy and Geology. (*Not printed.*)

No. 31.. Return shewing on a map or plan each timber limit or berth now under license, and each timber limit or berth disposed of at the sale in October last, whether yet under license or not, with the names of the present licensees or owners thereof marked thereon, and the area thereof, and the bonus *per* square mile paid in respect thereof, and the dates when the same were respectively first placed under license. (*Not printed.*)

No. 32.. Return shewing the names of the persons, firms and companies, indebted to the Province on the first day of January, 1886, on account of Timber Dues, Ground Rent, or Bonuses for Timber Limits, the amount of indebtedness in each case, the balance, if any, due by such persons, firms and companies, on the first day of January in each year since 1880. The total amount of such indebtedness on the 1st day of January, 1886. (*Not printed.*)

No. 33.. Return shewing the persons by whom, and the limits or births in respect of which, the bonuses appearing as accruals from Woods and Forests, were payable in each year since 1871, the balances which remain unpaid on account of bonuses on the 31st December, in each year since 1871, with the names of the persons by whom the same were respectively owing, and the amount owed by each of them, and in respect of what limit or berth it was due, and the period during which it had remained unpaid after it became due, the amounts which in each of the said years were allowed to licensees in reduction of the sums owing by them, with the names of the persons to whom the allowances were made, the amount of each allowance and the reasons for making them. (*Not printed.*)

No. 34.. Return of copies of all Orders in Council relating to the sale of timber limits, which took place in October last. The names of the purchasers at the sale, the several limits bought by each purchaser, with the area of each of them, and the bonus *per* square mile agreed to be paid for each such limit. The deposit paid by each purchaser, the amount since paid on each purchase, and the nature of the security, if any, given for the residue of the price. The several limits which had been bid off at the sale which took place in October, 1872, and the price *per* square mile at which they were severally bid off at that sale. The names of all purchasers who have failed to comply with the conditions of sale. The names of all purchasers who have transferred their claims to other persons with the names of the transferees and dates of transfers to them respectively. The several limits, if any, put up for sale and not sold and the disposition since made of them and the authority under which such disposition was made. (*Printed.*)

No. 35.. Report of the Commissioners appointed to revise and consolidate the Public Statutes of the Province. (*Printed.*)

No. 36.. Report of the Commissioners for Niagara Falls Park. (*Printed.*)

No. 37.. Analysis of Reports of County and Township Agricultural Societies and of Horticultural Societies for the year 1885, in accordance with the provisions of sections 47 and 48, chapter 35, R. S. O. (*Not printed.*)

No. 38.. Regulations respecting Mechanics' Institutes and Art Schools. (*Not printed.*)

No. 39.. Correspondence respecting the land and timber in the recently Disputed Territory of the Province. (*Printed.*)

No. 40.. Copies of all regulations made by the Lieutenant-Governor in Council, under the Act to amend the Free Grants and Homesteads Act, 43 Vic., cap. 4. (*Not printed.*)

No. 41.. Return from the Queen's Printer as to the disposal of the Revised Statutes of Ontario for the year 1886. (*Not printed.*)

No. 42.. Return from the Queen's Printer as to the disposal of the Statutes of Ontario for the year 1886. (*Not printed.*)

No. 43. Return shewing what application has been made for payments out of the Consolidated Revenue, under the provisions of Sec. 4, cap. 4, 43 Vic., in respect of the dues on pine trees. Also, shewing what is the aggregate sum which, up to the first day of March last, the patentees of lands subject to the provisions of the Act, are entitled to receive out of the dues collected on pine trees cut after date of their Patents. (*Not printed.*)

No. 44.. Return giving copies of all correspondence with the Architect, Mr. Waite, concerning the plans prepared by him for the proposed new Parliament and Departmental Buildings, and any agreement made with him concerning his remuneration as such Architect. (*Printed.*)

No. 45.. Statement of the Returns forwarded to the office of the Provincial Secretary of all the Fees and Emoluments received by the Registrars of Ontario for the year 1886, made in accordance with the provisions of the R. S. O. Cap. 111, Sec. 97 and 43 Vic., Cap. 3, Sec. 2, with which are contrasted receipts of same nature in 1884 and 1885. (*Printed.*)

No. 46.. Statement in detail of receipts and expenditures on account of the Mercer Estate for the year 1885. (*Not printed.*)

No. 47.. Statement in detail of receipts and expenditures on account of the Mercer Estate for the year 1886. (*Not printed.*)

No. 48.. Copies of all correspondence, papers and reports, between the Department of Education and William S. Summerby and O. Dufort, Inspectors of Public Schools, in the United Counties of Prescott and Russell, during the last year, on the subject of Public Schools in the French Settlements of these Counties. Also, copies of all reports respecting the alleged difficulties between the English and French ratepayers of the town of L'Orignal, or, upon the propriety of establishing a Separate School for Protestant children in that town. (*Printed in part.*)

No. 49.. Return of copies of all correspondence subsequent to the year 1882, between the Department of Public Works and any person or persons with reference to the regulation of the waters of Lakes Simcoe and Couchiching, together

with the reports of the Engineer, shewing the amount expended in removing obstructions from the outlets of the lakes and also the condition in which the outlets are at the present time. (*Not printed.*)

No. 50.. Annual Reports of the Dairy Associations of Ontario for the year 1886. (*Printed.*)

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No. 64..	Return shewing the number of cases brought before E. B. Borron, Stipendiary Magistrate for Northern Nipissing, for adjudication during each year since his appointment; and shewing also, the other duties performed by him in each year. (*Printed.*)
No. 65..	Detailed Statement of all Bonds and Securities recorded in the Provincial Secretary's office, since the last return submitted to the Legislative Assembly, made in accordance with the provisions of the Statute. (*Not printed.*)
No. 66...	Statement of the Assets, Liabilities, Revenue, etc., of the municipalities within the several Counties in the Province for the year 1885. (*Not printed.*)
No. 67..	Return shewing the number of votes polled by widows and unmarried women in the municipalities of the Province at the late municipal elections. (*Not printed.*)
No. 68..	Report of the Entomological Society for 1886. (*Printed.*)
No. 69..	Return shewing the agreement entered into between the Province and the Roman Catholic Episcopal Corporation of the Diocese of Kingston for the use of the building known as Regiopolis College. The amount expended for repairs and improvements, made at the expense of the Province, upon the building. (*Printed.*)
No. 70..	Report of the Inspector of Legal Offices. (*Printed.*)

SEVENTEENTH ANNUAL REPORT

OF THE

INSPECTOR OF PRISONS AND PUBLIC CHARITIES

UPON THE

HOUSES OF REFUGE

AND

ORPHAN & MAGDALEN ASYLUMS

AIDED BY THE

PROVINCE OF ONTARIO,

BEING FOR THE YEAR ENDING 30TH SEPTEMBER,

1886.

Printed by Order of the Legislative Assembly.

Toronto:
PRINTED BY WARWICK & SONS, 26 AND 28 FRONT STREET WEST,
1887.

Office of the
Inspector of Prisons and Public Charities, Ontario,
Parliament Buildings, Toronto, December, 1886.

Sir,—I have the honour to transmit herewith, to be presented to his Honour the Lieutenant-Governor, the Seventeenth Annual Report upon the Houses of Refuge and Orphan and Magdalen Asylums, aided by the Province, being for the year ending 30th September, 1886.

I have the honour to be,

Sir,

Your obedient servant,

R. CHRISTIE,
Inspector.

The Honourable
Arthur Sturgis Hardy, Q.C., M.P.P.,
Secretary of the Province of Ontario,
Toronto.

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HOUSES OF REFUGE AND ORPHAN AND MAGDALEN ASYLUMS.

SEVENTEENTH

ANNUAL REPORT

OF THE

Inspector of Prisons and Public Charities

FOR THE

PROVINCE OF ONTARIO.

PARLIAMENT BUILDINGS,

Toronto, October, 1886.

To the Honourable JOHN BEVERLEY ROBINSON, *Lieutenant-Governor of the Province of Ontario.*

MAY IT PLEASE YOUR HONOUR:—

Herewith I beg to submit the Seventeenth Annual Report upon the Houses of Refuge and the Orphan and Magdalen Asylums aided by the Province of Ontario being for the official year which expired on the 30th September, 1886.

I have the honour to be,
Your Honour's most obedient servant,

R. CHRISTIE,
Inspector.

HOUSES OF REFUGE.

The institutions under this head, which are aided by the Government, now number 20; an addition of one having been made to the list since the previous report was written. The institution in question is the Protestant Home, Peterborough, a refuge which has been in existence for some years, but its managers only applied for aid, under the provitions of the Charity Aid Act, during last year.

The table which follows shews, in a summarized form, the work done in each Refuge during the year. For convenience of comparison I have added at the foot of the table the totals of the similar summary given in the preceding year's report:—

NAME OF REFUGES.	Location.	Number of persons in the Refuges on 1st October, 1885.	Number admitted to Refuges during the year.	Total number under lodgment during the year ending 30th Sept., 1886.	Number discharged during the year.	Number of deaths during the year.	Number of persons remaining in Refuges on the 30th Sept., 1886.
House of Industry	Toronto	64	85	149	78	8	63
House of Providence	"	264	241	505	184	42	279
Home for Incurables	"	53	24	77	7	6	64
Aged Women's Home	"	16	10	26	3	5	18
House of Refuge	Hamilton	70	85	155	72	10	73
Home for Aged Women	"	24	2	26	.....	4	22
House of Industry	Kingston	42	68	110	73	1	36
House of Providence	"	60	64	124	49	20	55
Home for Aged and Friendless	London	10	5	15	9	.....	6
Roman Catholic House of Refuge	"	33	22	55	12	4	39
St. Patrick's House of Refuge	Ottawa	97	178	275	156	11	108
St. Charles' Hospice	"	74	32	106	20	10	76
House of Providence	Guelph	39	81	120	68	3	49
Protestant Home (Refuge Branch)	St. Catharines	1	2	3	1	.....	2
The Home	St. Thomas	11	19	30	14	4	12
House of Providence	Dundas	92	50	142	42	12	88
Home for the Friendless	Chatham	13	22	35	18	4	13
Widows' Home	Brantford	9	6	15	3	.....	12
Home for the Friendless	Belleville	12	11	23	7	7	9
Protestant Home	Peterboro'	6	19	25	15	.....	10
Totals		990	1,026	2,016	831	151	1,034
Totals for 1885		885	972	1,857	729	150	978

It will thus be seen that the number of persons maintained rose from 972 in 1885 to 1,026 in 1886, a slight increase of 54, and that at the close of the year, the population of the Refuges was greater by 44 persons than at the opening. One hundred and two more discharges took place in 1886 than in 1885, and one more death.

The usual information from each Refuge, in respect of sex, religious denominations, nationalities, and previous residences of the inmates, has been summarized as under :—

Sex.

Male	933	
Female	1,083	
		2,016

Religious Denominations.

Roman Catholic	1,483	
Protestant	533	
		2,016

Nationalities.

Canadian	393	
English	366	
Irish	1,067	
Scotch	105	
United States	47	
Other countries	38	
		2,016

Previous Residence.

Received from Cities or Towns in which the Refuges are located	1,261	
Received from Counties in which the Refuges are located	199	
Received from other Counties in the Province	358	
Emigrants and foreigners	198	
		2,016

The next table shews the collective stay of inmates in each of the Institutions, upon which the amount of aid to be granted by the Government is based. The totals of the previous year are also given at the foot of the table:—

NAMES OF REFUGES.	Location.	Total number of Inmates during the year.	Total stay in days during the year.	Average stay per Inmate in days.
House of Industry	Toronto	149	29400	197
House of Providence	do	505	100087	198
Home for Incurables	do	77	21109	274
Aged Women's Home	do	26	5572	214
House of Refuge	Hamilton	155	25362	164
Home for Aged Women	do	26	8774	338
House of Industry	Kingston	110	15679	142
House of Providence	do	124	24889	200
Home for the Aged and Friendless	London	15	3081	205
Roman Catholic House of Refuge	do	55	14215	258
St. Patrick's House of Refuge	Ottawa	275	41915	271
St. Charles' Hospice	do	106	27766	262
House of Providence	Guelph	120	15611	130
Protestant Home (Refuge Branch)	St. Catharines	3	404	135
The Home	St. Thomas	30	4849	162
House of Providence	Dundas	142	32918	232
Home for the Friendless	Chatham	35	5397	154
Widows' Home	Brantford	15	3696	246
Home for the Friendless	Belleville	23	4134	179
Protestant Home	Peterboro'	25	3672	147
Totals		2016	388530	193
Totals for 1885		1857	362167	195

The total stay of the inmates in 1886 was 26,363 days longer than in 1885. The average stay per inmate was less by two days.

The next table shews the amount of grant which each Refuge has earned. The collective stay being larger, the aggregate of the grant has, of course, also increased.

NAME OF REFUGES.	Location.	Aggregate stay of inmates.	Fixed allowance at 5 cents per day for aggregate stay of inmates.	Amount received from all sources other than Government.	Supplementary allowance of ¼ of such receipts, provided amount does not exceed the 2 cents allowance.	Supplementary allowance of 2 cents per day.	Total Government allowance to each House of Refuge for the year 1887.
			$ c.	$ c.	$ c.	$ c.	$ c.
House of Industry	Toronto	29400	1470 00	7200 24		588 00	2058 00
House of Providence	do	71453	3572 65	18917 71		1429 06	9296 81
Do do (Incurable Ward)	do	28634	2863 40			1431 70	
Home for Incurables	do	21109	2110 90	5972 65		1055 45	3166 35
Aged Women's Home	do	5572	278 60	825 75		111 44	390 04
House of Refuge	Hamilton	25362	1268 10	6281 99		507 24	1775 34
Home for Aged Women	do	8774	438 70			175 48	614 18
House of Industry	Kingston	15679	783 95	4083 26		313 58	1097 53
House of Providence	do	24889	1244 45	4110 39		497 78	1742 23
Home for the Aged and Friendless	London	3081	154 05	2717 13		61 62	215 67
Roman Catholic House of Refuge	do	14215	710 75	11306 93		284 30	995 05
St. Patrick's House of Refuge	Ottawa	41915	2095 75			838 30	2934 05
St. Charles' Hospice	do	27766	1388 30	3873 58		555 32	1943 62
House of Providence	Guelph	15611	780 55	1699 35		312 22	1092 77
Protestant Home (Refuge Branch)	St. Catharines	404	20 20			8 08	28 28
The Home	St. Thomas	4849	242 45	1479 96		96 98	339 43
House of Providence	Dundas	32918	1645 90	4422 91		658 36	2304 26
Home for the Friendless	Chatham	5397	269 85	2588 26		107 94	377 79
Widows' Home	Brantford	3696	184 80	719 84		73 92	258 72
Home for the Friendless	Belleville	4134	206 70	856 21		82 68	289 38
Protestant Home	Peterboro'	3672	183 60	1345 82		73 44	257 04
Totals		388530	21913 65	78401 98		9262 89	31176 54
Totals for 1885		362167	20542 25	81071 06		8703 68	29245 93

I regret to observe a falling off in the receipts of many of the Refuges. This is a serious matter at a time when their populations seems to be rather increasing than decreasing.

The last table exhibits the cost of maintaining the Refuges. Following it will be found the separate reports upon each institution :—

NAMES OF REFUGES.	Location.	Aggregate stay of Inmates.	Cost of Dietaries.	Expenditure for fuel, salaries and wages, and all general expenses.	Total expenditure, exclusive of extraordinary repairs.	Average cost per inmate per day.
			$ c.	$ c.	$ c.	Cents.
House of Industry	Toronto	29400	5146 02	5554 00	10700 02	36.40
House of Providence	"	100087	10112 48	13921 34	24033 82	24.01
Home for Incurables	"	21109	2689 88	4701 54	7391 42	35.01
Aged Women's Home	"	5572	590 47	1147 47	1737 94	31.19
House of Refuge	Hamilton	25362	2974 89	3125 36	6100 25	24.06
Home for Aged Women	"	8774	.....	*	.....	.....
House of Industry	Kingston	15679	1181 21	1665 43	2846 64	18.22
House of Providence	"	24889	2850 58	3093 61	†5944 19	.....
Home for the Aged and Friendless	London	3081	1049 02	1930 85	†2979 87	.....
Roman Catholic House of Refuge	"	14215	4125 35	9322 72	†13448 07	.....
St. Patrick's House of Refuge	Ottawa	41915	.....	*	*	.....
St. Charles' Hospice	"	27766	1806 11	2579 82	4385 93	15.79
House of Providence	Guelph	15611	1729 51	1883 94	3613 45	23.14
Protestant Home (Refuge Branch)	St. Catharines	404	.....	*	*	.....
The Home	St. Thomas	4849	557 67	613 42	1171 09	24.15
House of Providence	Dundas	32918	4810 00	3350 96	8160 96	24.79
Home for the Friendless	Chatham	5397	601 82	2113 97	2715 79	50.32
Widows' Home	Brantford	3696	219 23	580 28	799 51	21.63
Home for the Friendless	Belleville	4134	426 71	870 32	1297 03	31.61
Protestant Home	Peterboro'	3672	780 34	559 13	1339 47	36.48
Totals	....	388530	41651 29	57014 16	98665 45	.....
Total for 1885	.....	362167	39459 16	46547 27	86006 43	.....

*Included with Orphanage Branch.
†Includes expenditure of Orphanage Branch.

SEPARATE REPORTS.

HOUSE OF INDUSTRY, TORONTO.

Full particulars of the operations of this Institution will be found in the annexed summaries.

Movements of Inmates.

In residence, 1st October, 1885		64
Admitted		85
Total number of inmates		149
Discharged	78	
Died	8	
In residence, 30th September, 1886	63	
		149

Places admitted from.

From the City of Toronto	145	
From the County of York and other counties	2	
Emigrants and foreigners	2	
		149

Sex.

Males	106	
Females	43	
		149

Nationalities.

English	50	
Irish	65	
Scotch	19	
Canadian	9	
Other countries	6	
		149

Religious Denominations.

Protestant	122	
Roman Catholic	27	
		149

Receipts.

From the Province of Ontario	$1,824 20
From the City of Toronto	3,000 00
From inmates	118 50
Income from property belonging to the House	828 80
Subscriptions and donations of private individuals	2,281 00
From other sources	971 94
	$9,024 44

Expenditures.

Food of all kinds	$5,146 02
Clothing, furniture and furnishings	680 61
Fuel, light and cleaning	3,093 17
Salaries and wages	276 68
Other expenditures	1,503 54
	$10,700 02

Government Aid for 1887.

Allowance for 29,400 days, at 5 cents	$1,470 00
Supplementary aid, at 2 cents per day	588 00
Total	$2,058 00

INSPECTION.

Copies of the reports made to the Government by me upon this Refuge are annexed :—

"My first inspection of the House of Industry, Toronto, during the official year was made on the 3rd of March. On that day there were in residence, 50 males and 24 females, all of whom appeared to be fit inmates of such an Institution, and they were evidently receiving due attention and kind treatment.

"The casual wards, which since their enlargement, are capable of accommodating 130 persons, were, I learned, well occupied as a rule, and it was stated that the increase in expenditure on account of casual and out-door relief has been very large. In 1882, the number of casuals sheltered was 3,724, at an expenditure of $372.40, and the total expenditure for casuals and out-door relief was $6,603.46. During the six winter months of 1885, the number of casuals admitted was 13,249, at a cost of $1,324.90, and adding the cost of out-door relief furnished, the total expenditure was $7,857.79. I was informed that the labour test had been applied to the able-bodied and physically strong who sought admission, by requiring them to saw wood in payment for their lodgings and meals. A lack of room, however, interfered with the continuance of this arrangement, which otherwise proved very satisfactory by limiting the number who applied for lodgings a second time to those who had complied with the labour regulation. This plan, however, did not lessen the number of applicants, nor relieve the Institution to any extent, for it was found that when one lot of the indigent or tramp class disappeared, another lot was ready to take its place. The out-door relief during the past winter, has, owing to the severity of the weather, taxed the resources of the Institution to a large extent.

"The House was neat and clean and in good order."

"I made a second inspection of the House of Industry, Toronto, on the 28th August.

"The inmates on that date numbered 65, namely, 43 males and 22 females. Their appearance shewed that judgment was exercised in admitting only such as required the care and shelter of the Institution, many of them being disabled and infirm. Every reasonable attention to cleanliness and order appeared to be observed throughout the Institution.

"The books also were in proper order."

HOUSE OF PROVIDENCE, TORONTO.

Full particulars of the operations of this Institution will be found in the annexed summaries.

Movements of Inmates.

In residence, 1st October, 1885	264	
Admitted	241	
Total number of inmates		505
Discharged	184	
Died	42	
In residence, 30th September, 1886	279	
		505

Places admitted from.

City of Toronto	341	
County of York, and other counties of Ontario	126	
Emigrants and foreigners	38	
		505

Sex.

Male	168	
Female	337	
		505

Nationalities.

English	25	
Irish	359	
Scotch	6	
Canadian	105	
Other countries	11	
		505

Religious Denominations.

Protestant	21	
Roman Catholic	484	
		505

Receipts.

From the Province of Ontario	$9,030 52
From the City of Toronto	1,000 00
From inmates, in payment of board	1,933 60
Subscriptions, donations, and bequests of private individuals	12,870 66
From other sources	3,113 45
	$27,948 23

Expenditures.

Food of all kinds	$10,112 48
Clothing, furniture and furnishings	2,674 07
Fuel, light and cleaning	3,579 90
Wages	
Ordinary repairs	887 10
Additions to buildings	3,881 79
Other expenditures	6,780 27
	$27,915 61

Government Aid for 1887.

Allowance for 71,453 days, at 5 cents	$3,572 65	
Supplementary aid, 2 cents per day	1,429 06	
		$5,001 71

Incurable Branch.

Allowance for 28,634 days, at 15 cents	4,295 10
Total	$9,296 81

INSPECTIONS.

Copies of the reports made to the Government by me upon this charity are annexed.

"My first inspection of the House of Providence, Toronto, during the official year was made on the 15th March. On that day there were 94 males and 183 females in residence, of whom 23 males and 54 females were in the ward for incurables, having been certified by the medical man in charge to properly belong to that class. There had been 13 deaths amongst the incurables since the beginning of the official year, viz., 5 men and 8 women. Three also left the House to be cared for by their friends and relatives.

"I found the Institution in excellent order throughout, notwithstanding that rather extensive repairs had been necessary in consequence of a fire having broken out in the attic some little time prior to my visit. The discovery of the fire in its incipiency and the prompt action taken to subdue it, fortunately averted what might have been a serious conflagration.

"I saw the food being served in a number of the refectories, and it appeared to be both wholesome and nicely served.

"The books of the Institution were found to be properly kept."

"A second inspection of the House of Providence, Toronto, was made by me on the 1st September. The records shewed the population of the Institution to be 428, (which included 144 youths under twelve years who are inmates of the Orphanage Branch), of whom 86 were adult males and 198 adult females.

"Of the whole number 21 males and 58 females were registered as and duly certified to be incurables.

"Since the date of my last visit no change in the condition of this Institution of any importance has taken place. The usual routine work appeared to have been satisfactorily carried on, and the whole management well looked after. From the appearance of the inmates, too, it was manifest that they were well cared for. The books of the Institution I found to be neatly and properly kept according to the rules and regulations.

HOME FOR INCURABLES, TORONTO.

Full particulars of the operations of this Institution will be found in the annexed summaries:—

Movements of Inmates.

In residence, 1st October, 1885	53	
Admitted	24	
Total number of inmates		77
Discharged	7	
Died	6	
In residence, 30th September, 1886	64	
		77

Places admitted from.

From City of Toronto	69	
From the County of York and other counties	8	
		77

Sex.

Male	33	
Female	44	
		77

Nationalities.

English	32	
Irish	17	
Scotch	12	
Canadian	16	
		77

Religious Denominations.

Protestant	74	
Roman Catholic	3	
		77

Receipts.

From the Province of Ontario	$3030 90
From the City of Toronto	1329 00
Payments from inmates	1022 08
Subscriptions and donations	3518 81
Other sources	102 76
	$9,003 55

Expenditure.

Food of all kinds	$2689 88
Clothing and furnishings	221 35
Fuel, light, and cleaning	1239 65
Salaries and wages	1863 18
Repairs	212 05
Other expenses	1165 31
	$7,391 42

Government Aid for 1887.

Allowance for 21,109 days at 10 cents per day	$2110 90
Supplementary grant, 5 cents per day	1055 45
Total	$3,166 35

INSPECTION.

Copies of the reports made to the Government by me upon this Home are annexed:—

"An inspection of the Home for Incurables, Toronto, was made by me on the 5th March. The inmates numbered 57, 24 males, 33 females. A large number of the patients were spoken to, and from the answers they gave it was judged that they were highly satisfied with the treatment they were receiving, and the provision made for their comfort. The building was in satisfactory order throughout.

"It was stated to me that contracts for the erection of the wing as originally designed were about completed, and that the work would be proceeded with during the coming summer. This addition will about double the capacity of the Institution. The estimated cost of the enlargement is $32,000, and every precaution seems to have been taken, with a view to securing as complete a structure as possible for the purpose of which it is intended."

"My second inspection of the Home for Incurables, Toronto, for the current year, was made on the 31st August. I saw all the inmates then being cared for; namely, 27 males, and 35 females. Many of them expressed their appreciation of the kind treatment they were receiving, and they all appeared to be well cared for. I found the premises neat, clean and orderly, and the affairs of the Institution appeared to be conducted systematically and with due regard to economy.

AGED WOMEN'S HOME, TORONTO.

Full particulars of the operations of this Institution will be found in the annexed summaries:—

Movements of Inmates.

In residence, 1st October, 1885	16	
Admitted	10	
Total number of inmates		26
Discharged	3	
Died	5	
In residence, 30th September, 1886	18	
		26

Religious Denominations.

Protestant	26	
		26

Nationalities.

English	12	
Irish	6	
Canadian	8	
	——	26

Places admitted from.

City of Toronto	22	
Town of Ingersoll	4	
	——	26

The receipts and expenditures of this Home are included with those of the Industrial Refuge.

Government Aid for 1887.

Allowance for 5,572 days, at 5 cents	$278.60
Supplementary aid, at 2 cents per day	111.44
Total	$390.04

INSPECTION.

Copies of the reports made to the Government by me upon this Home are annexed:—

"The Aged Women's Home, Toronto, was inspected by me on the 4th March, when I saw all the inmates, 14 in number.

"I found that the Home had been enlarged, and the accommodation increased. Preparations were being made for the reception of four or five more aged women. The addition to the building has been neatly completed, and everything pertaining to the Institution was found to be in satisfactory order."

"I made an inspection of the Aged Women's Home, Toronto, on the 30th August.

"I found the premises in excellent order, and every attention was apparently being paid in caring for the 17 old and infirm people, whom I saw. The records of the Institution were properly kept."

HOUSE OF REFUGE, HAMILTON.

Full particulars of the operations of this Institution will be found in the annexed summaries:—

Movements of Inmates.

In residence, 1st October, 1885	70	
Admitted	85	
Total number of inmates	——	155
Discharged	72	
Died	10	
In residence, 30th September, 1886	73	
	——	155

Places admitted from.

City of Hamilton	149	
County of Wentworth and other counties	3	
Other places	3	
		155

Sex.

Male	83	
Female	72	
		155

Religious Denominations.

Protestant	95	
Roman Catholic	60	
		155

Nationalities.

Canadian	17	
English	25	
Irish	79	
Scotch	20	
Other countries	14	
		155

Receipts.

From the Government of Ontario	$1,784.86
" City of Hamilton	5,863.23
" Municipalities	123.75
" Inmates	295.01
	$8,066.85

Expenditures.

Food of all kinds	$2,974.89
Clothing, furnishings, etc.	681.85
Fuel	697.08
Salaries and wages	869.00
Ordinary repairs	60.95
Other expenses	816.48
	$6,100.25

Government Aid for 1887.

Allowance for 25,362 days, at 5 cents	$1,268.10
Supplementary aid, at 2 cents per day	507.24
Total	$1,775.34

INSPECTIONS.

Dr. O'Reilly instructed Mr. Hayes to make the inspection of this Refuge. A copy of his report to Dr. O'Reilly is annexed :—

"I beg to report that as desired by you, I visited the House of Refuge, Hamilton, on the 24th of June. Since your last visit to it an addition has been made to the front of the building, bringing it up to the line of the sidewalk. The

extra room thus obtained affords accommodation for about 25 persons, and enables a better classification of the inmates to be made. Thus the women now occupy the ground floor; the more infirm and aged men the next floor and the men with full use of their limbs, sleep on the top flat. The fire-escapes have also been improved—the platform in the rear of the second flat has been enlarged, so that the steps to it from the top flat are now set at an easier angle than formerly; there is also a fire-escape in the front of the building. A telephone is now in the house, so that almost immediate connection can be made with the fire stations; there is also a fire alarm box within a few yards of the building, and some hand grenades are hung in the halls.

"I found that during last autumn and winter the names of several smallpox patients were borne on the books of the Refuge. These persons were lodged in a building on the Refuge premises until the Smallpox Hospital was ready. They were then moved and the building was burned. A few days before my visit, the Smallpox Hospital, which was quite close to the Refuge, was burned by incendiaries.

"The House was as clean and as orderly as could be expected.

"All the inmates were seen. They numbered 64; 43 males and 21 females.

"The books are correctly kept."

HOME FOR AGED WOMEN, HAMILTON.

Full particulars of the operations of this Institution will be found in the annexed summaries:

Movements of Inmates.

In residence, 1st October, 1885	24	
Admitted	2	
Total number of inmates		26
Died	4	
In residence, 30 September, 1886	22	
		26

Places admitted from.

City of Hamilton	26

Religious Denomination.

Protestant	26

Nationalities.

English	11	
Irish	9	
Scotch	4	
Canadian	2	
		26

The receipts and expenditures of this Institution are included with those of the Protestant Orphans' Home, Hamilton, and therefore details cannot be given here.

Government Aid for 1887.

Allowance for 8774 days, at 5 cents	$438 70
Supplementary aid, at 2 cents	175 48
Total	$614 18

INSPECTIONS.

Dr. O'Reilly instructed Mr. Hayes to make the first visit to this Refuge. A copy of his report is annexed :—

"As directed by you, I made an inspection of the Aged Women's Home, Hamilton, on the 24th June. At the time of my visit 16 out of the 24 inmates were at dinner. The portion of the building used by them was in very good order. The books are correctly kept."

A copy of the report made by Dr. O'Reilly to the Government upon this Refuge, is annexed :—

"I made the second inspection of the Aged Women's Home, Hamilton, on the 9th November. There were then in residence 22 aged women, who seemed to be receiving all due care and attention.

"The premises were in good order throughout, except that there is a lack of the means of ventilation. It would be an improvement if the present water closets were replaced by automatic ones."

HOUSE OF INDUSTRY, KINGSTON.

Full particulars of the operations of this Institution will be found in the annexed summaries :—

Movements of Inmates.

In residence, 1st October, 1885	42	
Admitted	68	
Total number of inmates		110
Discharged	73	
Died	1	
In residence, 30th September, 1886	36	
		110

Places admitted from.

City of Kingston	52	
County of Frontenac	6	
Other counties of Ontario	41	
Other places	11	
		110

Sex.

Male	85	
Female	25	
		110

Religious Denominations.

Protestant	77	
Roman Catholic	33	
		110

Nationalities.

Canadian	19	
English	31	
Irish	52	
Scotch	7	
Other counties	1	
		110

Receipts.

From the Province of Ontario	$1059 17
From the City of Kingston	1250 00
Payment from inmates	263 00
Subscriptions and donations	2570 26
	$5,142 43

Expenditures.

Food of all kinds	$1181 21
Clothing, furniture and furnishings	192 08
Fuel	268 20
Salaries and wages	360 00
Repairs, ordinary	14 90
Other expenses, including rent and taxes	830 25
	$2,846 64

Government Aid for 1887.

Allowance for 15,679 days, at 5 cents	$783 95
Supplementary aid, at 2 cents per day	313 58
	$1,097 53

INSPECTIONS.

Copies of the reports made by me to the Government upon this Refuge are annexed:—

"An inspection of the House of Industry, Kingston, was made by me on the 1st April. I then saw all the inmates who numbered 51—34 males and 17 females. I found that nothing unusual in the condition of the Institution had occurred since the time of my previous visit.

"Preparations were being made for adding a new wing to the building, at an estimated cost of from $3,000 to $4,000, and will provide accommodation for about 25 additional persons."

"I made a second inspection of the House of Industry, Kingston, on the 9th September, and found 22 males and 14 females in charge. The Institution was

somewhat out of order on the day of my visit, occasioned by the building operations going on. The new addition, I was glad to see, was approaching completion. It has been erected on the north of the present structure; its dimensions are 22 feet by 44 feet, three storeys in height. It contains one large dormitory, and eight rooms large enough to accommodate two inmates each.

"This new addition is substantially built, and is in most respects a credit to the designers and the Board of Management.

"The apparatus for hot-water heating was being put in place. A bath-room and water-closets are also provided. In the matter of ventilation, I noticed that fanlights have been placed above the doors of the rooms for that purpose; but I suggested that it would be a great improvement to have a ventilating shaft carried from the ceiling up through the roof, or into an adjoining flue, of sufficient capacity to insure perfect ventilation. This addition has been built, I understand, by funds left to the disposal of the Board of Management by a testator, who evidently had discovered the wants of the Institution."

HOUSE OF PROVIDENCE, KINGSTON.

Full particulars of the operations of this Institution will be found in the annexed summaries:—

Movements of Inmates.

In residence, 1st October, 1885	60	
Admitted	64	
Total number of inmates		124
Discharged	49	
Died	20	
In residence, 30th September, 1886	55	
		124

Places admitted from.

City of Kingston	24	
County of Frontenac	9	
Other counties and places	91	
		124

Sex.

Male	60	
Female	64	
		124

Religious Denominations.

Protestant	1	
Roman Catholic	123	
		124

Nationalities.

Canadian	31	
English	9	
Irish	61	
Scotch	8	
Other countries	15	
	——	124

Receipts.

From the Province of Ontario	$1,721 96
From Municipalities	50 00
Income from property	24 63
Payment from inmates	426 50
Subscriptions and donations	1,477 01
Other sources	2,132 25
	$5,832 35

Expenditures.

Food of all kinds	$2,850 58
Clothing and furnishing	820 76
Salaries and wages	50 00
Fuel, light and cleaning	726 65
Repairs, ordinary and extraordinary	199 56
Other expenses	1,296 64
	$5,944 19

Government Aid for 1887.

Allowance for 24,889 days, at 5 cents	$1,244 45
Supplementary aid, at 2 cents per day	497 78
Total	$1,742 23

INSPECTIONS.

Copies of the reports made by me to the Government upon this Refuge are annexed:—

"An inspection of the House of Providence, Kingston, was made by me on the 1st April. Fifty-seven adult males and females were in residence, many of whom were extremely old and infirm. They all appeared to be comfortably provided for."

"I again visited the House of Providence, Kingston, on the 9th September. The records shewed a population on that date of 47—23 adult males and 24 adult females, all of whom I saw, with the exception of three or four who had been sent out on errands.

"The Institution was in an excellent state of order and every provision made for the comfort of the inmates."

PROTESTANT HOME FOR THE AGED AND FRIENDLESS, LONDON.

Full particulars of the operations of this Institution will be found in the annexed summaries:—

Movements of Inmates.

In residence, 1st October, 1885	10	
Admitted	5	
Total number of inmates	——	15
Discharged	9	
Died	0	
In residence, 30th September, 1886	6	
	——	15

Places admitted from.

City of London	15	
	——	15

Sex.

Male	12	
Female	3	
	——	15

Religious Denominations.

Protestant	15	
	——	15

Nationalities.

Canadian	8	
English	6	
Irish	1	
Other countries		
	——	15

Receipts.

From the Province of Ontario	$498 20
From inmates in part payment of board	542 00
Income from property	937 28
Subscriptions, donations, etc	1,144 72
From other sources	93 13
	$3,215 33

Expenditures.

Food of all kinds	$1,049 02
Salaries and wages	706 22
Other expenses	1,224 63
	$2,979 87

There is an Orphanage connected with this Home, and the accounts of both are included in these statements.

Government Aid for 1887.

Allowance for 3,081 days, at 5 cents	154 05
Supplementary aid, at 2 cents per day	61 62
Total	$215 67

The report of the inspection of this Home is included with that of the Orphans' Home, London.

ROMAN CATHOLIC HOUSE OF REFUGE, LONDON.

Full particulars of the operations of this Institution will be found in the annexed summaries:—

Movements of Inmates.

In residence, 1st October, 1885	33	
Admitted	22	
Total number of inmates		55
Discharged	12	
Died	4	
In residence, 30th September, 1886	39	
		55

Places admitted from.

City of London	20	
County of Middlesex	4	
Other counties of Ontario	31	
		55

Sex.

Male	20	
Female	35	
		55

Religious Denominations.

Protestant	1	
Roman Catholic	54	
		55

Nationalities.

Canadian	10	
English	..	
Irish	45	
		55

The receipts and expenditures of this Charity are shewn in the report upon the Roman Catholic Orphans' Home, London

Government Aid for 1887.

Allowance for 14,215 days, at 5 cents	$710 75
Supplementary aid, at 2 cents per day	284 30
Total	$995 05

INSPECTIONS.

Copies of the reports made to the Government upon this Charity by Dr. O'Reilly, are annexed :—

"On the 17th May, I inspected the Roman Catholic House of Refuge, London. There were in residence on that day, 16 males, and 25 females.

"I found the building to be clean, neat, and orderly."

"I made a second inspection of the Roman Catholic House of Refuge, London, on the 15th September, finding therein 17 men and 25 women, a total population of 37. The wants of these people seemed to be properly looked after by the sisters in charge and the quarters occupied by them were as usual in good order."

ST. PATRICK'S REFUGE, OTTAWA.

Full particulars of the operations of this Institution are shewn in the annexed summaries :—

Movements of Inmates.

In residence, 1st October, 1885	97	
Admitted	178	
Total number of inmates		275
Discharged	156	
Died	11	
In residence, 30th September, 1886	108	
		275

Sex.

Male	163	
Female	112	
		275

Religious Denominations.

Protestant	4	
Roman Catholic	271	
		275

Nationalities.

Canadian	24	
English	101	
Irish	144	
Scotch	4	
Other countries	2	
	——	275

Places admitted from.

City of Ottawa	114	
County of Carleton and other counties	50	
Emigrants	111	
	——	275

The receipts and expenditure of this Charity are included with those of the Orphanage branch.

Government Aid for 1887.

Allowance for 41,915 days, at 5 cents	$2,095 75
Supplementary aid, at 2 cents per day	838 30
Total	$2,934 05

INSPECTIONS.

Copies of the reports made by me to the Government upon this Refuge are annexed :—

"An inspection of St. Patrick's Refuge, Ottawa, was made by me on the 6th May, when the inmates numbered 118, 45 males, 73 females. Many of them were very infirm, and they all appeared to be proper subjects for care in such a place.

"The building was in good order throughout, and the books neatly and correctly kept."

"I made another inspection of the St. Patrick's Refuge, Ottawa, on the 21st September, and I saw the inmates then in residence, 46 males and 63 females, making a total of 109. The old people appeared comfortable and well cared for. No material change has been made in the structure since the date of my last visit. The routine work is thoroughly systematised and properly carried out."

———

ST. CHARLES' HOSPICE, OTTAWA.

Full particulars of the operations of this Institution will be found in the annexed summaries :—

Movements of Inmates.

In residence, 1st October, 1885	74	
Admitted	32	
Total number of inmates	——	106
Discharged	20	
Died	10	
In residence, 30th September, 1886	76	
	——	106

Sex.

Male	41	
Female	65	
	——	106

Religious Denominations.

Protestant	1	
Roman Catholic	105	
	——	106

Nationalities.

Canadian	91	
English	14	
Other countries	1	
	——	106

Places admitted from.

City of Ottawa	64	
County of Carleton	18	
Other counties	24	
	——	106

Receipts.

From the Government of Ontario	$1,777	23
" County of Carleton	40	00
Income	105	86
From payments made by inmates	1,545	80
Subscriptions, donations, etc.	2,181	92
	$5,650	81

Expenditures.

Food of all kinds	$1,806	11
Clothing and furnishings	306	50
Fuel, light, cleaning, etc.	410	00
Salaries and wages	140	92
Repairs, ordinary and extraordinary	1,338	00
Other expenses	1,562	40
	$5,563	93

Government Aid for 1887.

Allowance for 27,766 days, at 5 cents per day	$1,388	30
Supplementary grant, at 2 cents	555	32
Total	$1,943	62

INSPECTIONS.

Copies of the reports made by me to the Government upon this Charity, are annexed :—

"I made an official visit to the St. Charles' Hospital, Ottawa, on the 6th May. All the inmates, viz., 28 males and 46 females, were seen.

"The building was in its usual condition of good order and cleanliness. A large proportion of the inmates were old and infirm and were evidently being kindly cared for."

"A second inspection of the St. Charles' Hospital, Ottawa, was made by me on the 21st September, when I found 29 males and 47 females in residence.

"The apartments for the accommodation of both the male and female population of the Institution were found to be nicely kept.

"I was informed that land had been purchased in the neighborhood of the city at a cost of $4,000, with a view to providing employment for a number of the men who are able to do more or less work in the summer season. This land will be utilized for gardening and pasturage."

HOUSE OF PROVIDENCE, GUELPH.

Full particulars of the operations of this Institution will be found in the annexed summaries :—

Movements of Inmates.

In residence, 1st October, 1885	39	
Admitted	81	
Total number of inmates		120
Discharged	68	
Died	3	
In residence, 30th September, 1886	49	
		120

Places admitted from.

From the City of Guelph	48	
From the County of Wellington and other counties	45	
Foreigners, etc	27	
		120

Sex.

Male	54	
Female	66	
		120

Religious Denominations.

Protestant	5	
Roman Catholic	115	
		120

Nationalities.

Canadian	27	
English	12	
Irish	67	
Other countries	14	
		120

Receipts.

Province of Ontario	$1067 57
Municipalities	36 00
From inmates in part payment for board	436 35
Income from property	400 00
From all other sources	827 20
	$2,767 12

Expenditures.

Food of all kinds	$1729 51
Clothing and furnishings	740 47
Fuel, light and cleaning	215 00
Salaries and wages	70 00
Ordinary repairs	50 19
Other expenses	808 28
	$3,613 45

Government Aid for the year 1887.

Allowance for 15,611 days, at 5 cents per day	$780 55
Supplementary aid at 2 cents	312 22
	$1,092 77

INSPECTIONS.

A copy of the report made to the Government upon this Refuge by Dr. O'Reilly, is annexed :—

"On the 3rd June, I made my first inspection during the official year of the House of Providence, Guelph.

"There were in residence on that day 23 men, 22 women and 1 child, a total of 46. The inmates were all well cared for, and the Institution was in good order throughout."

The second inspection was made by Mr. Hayes. A copy of his report to Dr. O'Reilly, is annexed :—

"I beg to state that as instructed by you, I made an inspection of the House of Providence, Guelph, on the 8th October.

"The register shewed that the number of persons being maintained was 48, viz. : 25 men, 22 women and 1 child. I did not see all these persons as the fineness of the weather had tempted many of them into the adjacent fields.

"It is unfortunate that these indigents—several of whom are bed-ridden—have to be lodged in the upper flat of the building, as in the event of a fire there would be great difficulty in getting them out of the house. The quarters occupied by these persons were in as good order as could be expected."

PROTESTANT HOME, ST. CATHARINES (REFUGE BRANCH).

Full particulars of the operations of the Refuge Branch of this Institution will be found in the annexed summaries :—

Movements of Inmates.

In residence, 1st October, 1885	1	
Admitted	2	
Total number of inmates	—	3
Discharged	1	
In residence, 30th September, 1886	2	
	—	3

Places admitted from.

City of St. Catharines	3	
	—	3

Sex.

Male	1	
Female	2	
	—	3

Religious Denominations.

Protestant	3	
	—	3

Nationalities.

Canadian	1	
English	2	
	—	3

The receipts and expenditures of this Branch of the Charity are included in the accounts of the Orphanage.

Government Aid for 1887.

Allowance for 404 days, at 5 cents per day	$20 20	
Supplementary aid, at 2 cents	8 08	
Total	$28 28	

The inspection report upon this Branch is included with that upon the Orphanage.

THE HOME, ST. THOMAS.

Full particulars of the operations of this Institution will be found in the annexed summaries :—

Movements of Inmates.

In residence, October 1st, 1885	11	
Admitted	19	
Total number of inmates	—	30
Discharged	14	
Died	4	
In residence, 30th September, 1886	12	
	—	30

Places admitted from.

City of St. Thomas	29	
County of Middlesex	1	
	—	30

Sex.

Male	14	
Female	16	
	—	30

Religious Denominations.

Protestant	22	
Roman Catholic	8	
	—	30

Nationalities.

Canadian	2	
English	14	
Irish	8	
Other countries	6	
	—	30

Receipts.

From the Province of Ontario	$338 25
From the City of St. Thomas	669 79
From payments by inmates	51 00
From other sources	759 17
	$1,818 21

Expenditures.

Food of all kinds	$557 67
Clothing and furnishings	33 81
Fuel, light, cleaning, etc	126 31
Salaries and wages	280 00
Other expenses	173 30
	$1,171 09

Government Aid for 1887.

Allowance for 4,849 days' stay, at 5 cents per day	242 45
Supplementary aid, at 2 cents	96 98
Total	$339 43

INSPECTIONS.

Copies of the reports made to the Government upon this Home by Dr. O'Reilly are annexed:—

"An inspection of the Home, St. Thomas, was made by me on the 11th March. There were then 8 men, 7 women and 2 children in residence.

"I am glad to be able to report that at each successive visit to this Institution, I find some evidence of steady progress towards making it a most comfortable and efficient one. There is now very little more needed in the way of furniture and furnishings to meet all requirements. The most important improvement yet to be effected is in the direction of heating, the building being now heated with a number of wood stoves, and I noticed in several instances that the pipes were not in good order—in fact were quite unsafe. All these stoves and pipes are a source of great danger, and I trust that the funds of the Home will soon permit of a proper system of hot water heating being adopted."

"I made a second inspection of the Home, St. Thomas, on the 2nd October. The inmates then numbered 14, namely, 6 men, 7 women, and 1 child.

"The premises throughout were in very nice order. There is a constant improvement going on in the condition of this Home, which shews commendable energy on the part of the managers."

HOUSE OF PROVIDENCE, DUNDAS.

Full particular of the operations of this Institution will be found in the annexed summaries :—

Movements of Inmates.

In residence, 1st October, 1885	92	
Admitted	50	
Total number of inmates		142
Discharged	42	
Died	12	
In residence, 30th September, 1886	88	
		142

Places admitted from.

City of Hamilton	81	
County of Wentworth and other counties	23	
Other places	38	
		142

Sex.

Male	52	
Female	90	
		142

Religious Denominations.

Protestant	3	
Roman Catholic	139	
		142

Nationalities.

Canadian	20	
English	3	
Irish	113	
Scotch	3	
Other countries	3	
		142

Receipts.

From the Province of Ontario	$2,353 47
From the City of Hamilton	150 00
From the County of Wentworth	200 00
From inmates	705 80
Income	727 31
Subscriptions and donations of private individuals	834 55
Other sources	1,805 25
	$6,776 38

Expenditures.

Food of all kinds	$4,810 00
Clothing, furniture and furnishings	560 06
Fuel, light and cleaning	1,019 43
Other expenditures	1,771 47
	$8,160 96

Government Aid for 1887.

Allowance for 32,918 days' stay, at 5 cents	$1,645 90
Suplementary aid, at 2 cents per day	658 36
Total	$2,304 26

INSPECTION.

A copy of the report made to the Government by Dr. O'Reilly upon this Refuge, is annexed :—

"I made an inspection of the House of Providence, Dundas, on the 10th July, on which date the inmates numbered as follows:—34 adult males, 53 adult females and 94 boys.

"The Institution throughout was found to be in excellent order."

THE HOME FOR THE FRIENDLESS, CHATHAM.

Full particulars of the operations of this Institution will be found in the annexed summaries :—

Movements of Inmates.

In residence, 1st October, 1885	13	
Admitted	22	
Total number of inmates		35
Discharged	18	
Died	4	
In residence, 30th September, 1886	13	
		35

Places admitted from.

Town of Chatham	18	
County of Kent	3	
Emigrants, foreigners, etc.	14	
		35

Sex.

Male	20	
Female	15	
		35

Religious Denominations.

Protestant	22	
Roman Catholic	13	
		35

Nationalities.

Canadian	4	
English	9	
Irish	5	
Scotch	6	
Other countries	11	
		35

Receipts.

From the Province of Ontario	$ 324 59
From the Town of Chatham	2,135 36
From other sources	452 90
	$2,912 85

Expenditures.

Food of all kinds	$601 82
Clothing and furnishing	93 34
Fuel, light, cleaning, etc	371 22
Salaries and wages	492 00
Other expenses	1,157 41
	$2,715 79

Government Aid for 1887.

Allowance for 5,397 days' stay, at 5 cents per day	$269 85
Supplementary aid, at 2 cents	107 94
Total	$377 79

THE WIDOWS' HOME, BRANTFORD.

Full particulars of the operation of this Institution will be found in the annexed summaries:—

Movements of Inmates.

In residence, 1st October, 1885	9	
Admitted	6	
Total number of inmates		15
Discharged	3	
Died		
In residence, 30th September, 1886	12	
		15

Places admitted from.

City of Brantford	11	
Province of Ontario	2	
Emigrants, foreigners, etc.	2	
		15

Sex.

Female	15	
		15

Religious Denominations.

Protestant	14	
Roman Catholic	1	
		15

Nationalities.

English	6	
Irish	2	
Other countries	7	
		15

Receipts.

From the Province of Ontario	$301 49
From inmates	178 00
From other sources	541 84
	$1,021 33

Expenditure.

Food of all kinds	$219 23
Clothing and furnishing	25 36
Fuel, light, cleaning, etc.	155 74
Salaries and wages	151 68
Other expenses	247 50
	$799 51

Government Aid for 1887.

Allowance for 3,696 days' stay, at 5 cents per day	$184 80
Supplementary aid, at 2 cents	73 92
Total	$258 72

INSPECTIONS.

A copy of the report made upon this Home to the Government by Dr. O'Reilly, is annexed :—

"An inspection of the Widows' Home, Brantford, was made by me on the 5th May, when there were 11 inmates.

"The Home was in its usual satisfactory condition. The books I did not find to be so, there being some misunderstanding as to the use of the daily record, and consequently this book had not been entered up since last November. I called the attention of the Secretary to the necessity of having the entries made in this book daily."

Dr. O'Reilly instructed Mr. Hayes to make the second visit to the Home. A copy of his report is appended :—

"As directed by you, I made an inspection of the Widows' Home, Brantford, on the 25th September. The inmates, who numbered 11, were all seen. They appeared to be comfortable and to be well looked after. The register was not at the Home, as the Secretary was using it in the preparation of the annual return. The daily record was entered up.

"The building was in good order. A new matron has recently been appointed."

THE HOME FOR THE FRIENDLESS, BELLEVILLE.

Full particulars of the operations of this Institution will be found in the annexed summaries :—

Movements of Inmates.

In residence, 1st October, 1885	12	
Admitted	11	
Total number of inmates		23

Discharged	7	
Died	7	
In residence, 30th September, 1886	9	
		23

Places admitted from.

From the City of Belleville	18	
From the County of Hastings and other counties	5	
		23

Sex.

Male	13	
Female	10	
		23

Religious Denominations.

Protestant	19	
Roman Catholic	4	
		23

Nationalities.

English	5	
Irish	12	
Scotch	2	
Canadian	4	
		23

Receipts.

From the Province of Ontario	$304	36
From the City of Belleville	300	00
From inmates	135	25
Subscriptions and donations	420	96
	$1,160	57

Expenditures.

Food of all kinds	$426	71
Clothing and furnishings	87	76
Fuel, light and cleaning	136	00
Salaries and wages	238	70
Other expenses	389	86
	$1,279	03

Government Aid for 1887.

Allowance for 4,134 days, at 5 cents per day	$206	70
Supplementary aid, 2 cents	82	68
Total	$289	38

INSPECTION.

Copies of the reports made by me to the Government upon this Refuge are annexed :—

" An inspection of the Home for the Friendless, Belleville, was made by me on the 27th January. The inmates then numbered 11 ; 7 males and 4 females. They appeared to be receiving all the care and attention that could be bestowed

upon them under the conditions in which they were situated. In consequence of an overflow of the river, the cellar of the building was full of water and the back premises had also been covered. This state of things, however unavoidable, was certainly very adverse to comfort and health, and I was glad to learn that the new buildings would be ready for occupation at an early day, and that no time would be lost in removing from the old building so soon as the weather was favourable. The books were found to be in proper order."

"I made a second inspection of the Home for the Friendless, Belleville, on the 14th September. There were on that date ten old people in residence in a section of the new building, which has been built for their special accommodation. The building in all departments is well fitted for the purpose for which it has been constructed, and abundant provision has been made for the accommodation of the old and infirm people requiring the shelter of such an Institution."

THE PROTESTANT HOME, PETERBOROUGH.

The managers of this Home having petitioned the Government for aid under the provisions of the Charity Aid Act, I was desired to visit the Home and to report upon its capacity, management, etc. A copy of my report to the Provincial Secretary, dated 3rd June, 1886, is appended:—

"In accordance with instructions received, I visited the Protestant Home, Peterborough, on the 27th May. There were 14 people being maintained in the Home on the day of my visit. They all, by reason either of age or infirmity, belong to the class eligible for admission into institutions devoted to the care of the destitute.

"Structurally, the Home is well adapted to its purpose. It is large and substantially built, and with some alterations could be made to accommodate a much larger number of persons than at present. In the internal management, every care and consideration is apparently given to the well-being of the inmates. The permanency of the Institution is well assured by the provisions adopted in that regard. As stated in the petition of the President and Secretary, the Home has been in existence for the past fifteen or sixteen years, and the work undertaken has been regularly and systematically carried on during that period. The property has been given to the Association in trust for the purposes specified, so that the continuance of the charity appears to be satisfactorily provided for.

"I could not learn that any other institution was in existence in Peterborough, or its immediate vicinity, having for its object similar work to the one under report and hence the necessity for maintaining this charity. I would, therefore, recommend that the prayer of the petition be granted, and that an Order in Council be passed, ordering that the Protestant Home, Peterborough, be taken as named in Schedule B, of the Charity Act, and receive aid in accordance therewith, from the 1st October, 1885."

My recommendation was approved of and an Order in Council passed granting aid to this Home, subject to ratification by the Legislature at its next session.

Full particulars of the operations of this Institution will be found in the annexed summaries:—

Movement of Inmates.

In residence, 1st October	6	
Admitted	19	
Total number of inmates		25

Discharged	15	
Died		
In residence, 30th September, 1886	10	
	——	25
Places admitted from.		
From the Town of Peterborough	12	
From the County of Peterborough and other counties	13	
	——	25
Sex.		
Male	7	
Female	18	
	——	25
Religious Denominations.		
Protestant	25	
	——25	
Nationalities.		
English	18	
Irish	2	
Scotch	2	
Canadian	3	
	——	25

Receipts.

From Municipalities for board of inmates	$183 62
From inmates	22 75
Subscriptions and donations	1,139 45
	$1,345 82

Expenditures.

Food of all kinds	$780 34
Clothing and furnishings	64 00
Fuel, light and cleaning	157 00
Salaries and wages	121 50
Other expenses	216 63
	$1,339 47

Government Aid for 1887.

Allowance for 3,672 days, at 5 cents per day	$183 60
Supplementary aid, at 2 cents	73 44
Total	$257 04

INSPECTIONS.

I instructed Mr. Mann to make an inspection of the Home. A copy of his report to me is annexed:—

"I visited the Protestant Home, Peterborough, on the 4th September, 1886, on which occasion there were 14 persons in residence. Ten of these were adults—5 men and 5 women. All were old and feeble, depending entirely upon charity for existence. There were, also, 4 small children in the Home.

"This charity appears to be very well conducted and the building is very clean and tidy throughout.

ORPHAN ASYLUMS.

No addition has been made to the number of Orphanages aided by the Government since the last report upon them was written. The following table exhibits the admissions to, discharges from, and deaths in these Orphanages during the year:—

NAMES OF ORPHANAGES.	Location.	Number in residence 1st October, 1885.	Number admitted during the year ending 30th September, 1886.	Total number maintained during the year.	Number discharged during the year.	Number of deaths during the year.	Number remaining in residence on 30th September, 1886.
Roman Catholic Orphan Asylum	Toronto	281	202	483	184	19	280
Orphans' Home	do	145	93	238	66	1	171
Girls' Home	do	76	46	122	40	1	81
Boys' Home	do	87	73	160	50	.....	110
Newsboys' Lodgings	do	26	85	111	88	.....	23
Infants' Home	do	66	115	181	60	75	46
St. Nicholas' Home	do	46	120	166	112	1	53
Hospital for Sick Children	do	28	115	143	93	9	41
St. Mary's Orphan Asylum	Hamilton	160	106	266	84	9	173
Protestant Orphan Asylum	do	34	5	39	13	.....	26
Boys' Home	do	91	30	121	22	1	98
Girls' Home	do	71	45	116	39	.....	77
Orphans' Home	Kingston	54	17	71	15	.....	56
House of Providence Orphanage	do	23	28	51	36	.....	15
Hotel Dieu Orphanage	do	36	173	209	172	.....	37
Orphans' Home	Ottawa	38	43	81	43	6	32
St. Patrick's Orphan Asylum	do	51	66	117	60	1	56
St. Joseph's Orphan Asylum	do	101	85	186	90	.....	96
Roman Catholic Orphans' Home	London	95	65	160	63	3	94
Protestant Orphans' Home	do	50	37	87	39	.....	48
Protestant Home (Orphanage Branch)	St. Catharines	28	11	39	9	.....	30
Orphan Asylum	St. Agatha	36	8	44	6	.....	38
The Home (Orphanage Branch)	St. Thomas	3	3	6	6	.....	.....
Orphans' Home	Fort William	14	28	42	5	1	36
Totals	.....	1,640	1,599	3,239	1,395	127	1,717
Totals for 1885	.....	1,672	1,624	3,296	1,562	95	1,639

It will be seen that there was a decrease of 57 in the total number cared for in 1886, as compared with 1885, but owing to the large decrease of 167 in the discharges, the population at the end of the year was 77 greater than in the beginning, notwithstanding an increased number of deaths, which rose from 95 in 1885, to 127 in 1886. Three-fifths of these deaths occurred in the Infants' Home in Toronto, where there was an epidemic of measles amongst the children. There were an unusually large number of deaths, too, in the Roman Catholic Orphan Asylum in Toronto.

The statistics relating to the sex, religious denominations, and nationalities of the inmates are given in the following summary:—

Sex.

Male	1,793	
Female	1,446	
		3,239

Religious Denominations.

Protestant	1,634	
Roman Catholic	1,605	
		3,239

Nationalities.

Canadian	2,308	
English	400	
Irish	381	
Scotch	76	
United States	50	
Other countries and unknown	24	
		3,239

Previous Residence.

Received from cities in which Orphanages are located	2,320	
Received from counties in which Orphanages are located	299	
Received from other counties in the Province	471	
Emigrants and foreigners	149	
		3,239

The next table shews the aggregate stay of the inmates of the Orphanages, the fixed allowances in respect thereof under the Charity Aid Act, the receipts of the Institutions on maintenance account, the amount of the supplementary allowance, together with the total amount which each Institution has become entitled to as the grant for the year 1887.

NAMES OF ORPHANAGES.	LOCATION.	Aggregate stay of inmates.	Fixed allowance at one and a half cent per day.	Amount received from all sources other than Government.	Supplementary allowance of one quarter such receipts, provided amount does not exceed the half cent allowance.	Supplementary allowance of half cent per day.	Total Government grant for the year 1887.
			$ c.	$ c.	$ c.	$ c.	$ c.
Roman Catholic Orphan Asylum	Toronto	104277	1564 15	6789 23	.....	521 39	2085 54
Orphans' Home and Female Aid Society	do	58274	874 11	8108 19	.....	291 37	1165 48
Girls' Home	do	30447	456 70	4730 16	.....	152 24	608 94
Boys' Home	do	34137	512 05	5201 00	.....	170 69	682 74
Newsboys' Lodgings	do	10364	155 46	2643 40	.....	51 82	207 28
Infants' Home and Infirmary	do	22025	.....	2462 52	.....	.....	‡1225 24
St. Nicholas Home	do	15900	238 50	3553 27	.....	79 50	318 00
Hospital for Sick Children	do	12031	.....	5303 40	.....	.....	1804 65
do do Convalescent Branch	do	1556	.....		.....	.....	108 92
St. Mary's Orphan Asylum	Hamilton	62555	938 32	5580 26	.....	312 78	1251 10
Orphan Asylum	do	10677	160 15	*3513 28	.....	53 39	213 54
Boys' Home	do	34566	518 49	3713 02	.....	172 83	691 32
Girls' Home	do	26869	403 03	2320 78	.....	134 35	537 38
Orphans' Home	Kingston	17554	263 31	2457 69	.....	87 77	351 08
House of Providence Orphan Asylum	do	7826	117 39	†	.....	39 13	156 52
Hotel Dieu Orphan Asylum	do	14259	213 88	552 00	.....	71 30	285 18
Orphans' Home	Ottawa	13460	201 90	7592 76	.....	67 30	269 20
St. Patrick's Orphan Asylum	do	21197	317 95	7920 53	.....	105 99	423 94
St. Joseph's Orphan Asylum	do	36559	548 38	4861 99	.....	182 80	731 18
Roman Catholic Orphans' Home	London	35857	537 85	†	.....	179 29	717 14
Protestant Orphans' Home	do	17853	267 79	†	.....	89 27	357 06
Protestant Home (Orphanage Branch)	St. Catharines	10413	156 19	1598 40	.....	52 07	208 26
Orphan Asylum	St. Agatha	13487	202 30	849 48	.....	67 44	269 74
The Home (Orphanage Branch)	St. Thomas	513	7 69	†	.....	2 57	10 26
Orphan Asylum	Fort Williams	11145	167 17	770 25	.....	55 73	222 90
Totals		623801	8822 76	80521 61	.....	2941 02	14902 54
Totals for 1885		614590	8548 05	73688 41	.....	2849 43	14526 24

* Includes receipts of Refuge Branch.
† Included with Refuge Branch.
‡ This sum includes 10 cents per day for the mother nurses, and a grant of $200 for Infirmary work.

A gratifying feature in this table is the increase in the amount received by these various charities from the general public. The collective stay of the inmates was 9,211 days more in 1886 than in 1885, and the money earned has increased from $14,526.24 to $14,902.59.

The next table shews the cost of maintaining these Orphanages, after which will be found the separate reports upon each of them:—

NAMES OF ORPHANAGES.	LOCATION.	Aggregate stay of inmates.	Total expenditure on maintenance account for the year ending 30th of September, 1886.		Average cost per inmate per day.
			$	c.	Cents.
Roman Catholic Orphan Asylum	Toronto	101277	8736	50	8.38
Orphans' Home and Female Aid Society	do	58274	10196	08	17.50
Girls' Home	do	30147	5322	23	17.47
Boys' Home	do	34137	5733	89	16.80
Newsboys' Lodgings	do	10364	2661	46	25.72
Infants' Home and Infirmary	do	22025	3791	23	17.21
St. Nicholas Home	do	13900	3791	81	23.84
Hospital for Sick Children	do	13587	6907	16	51.20
St. Mary's Orphan Asylum	Hamilton	62555	6672	61	10.66
Orphan Asylum	do	10677	*4359	06	.....
Boys' Home	do	34566	4132	15	11.95
Girls' Home	do	26869	2885	59	10.74
Orphans' Home	Kingston	17554	3104	63	17.66
House of Providence Orphan Asylum	do	7826	†	.....	.....
Hotel Dieu Orphan Asylum	do	14259	1196	40	8.38
Orphans' Home	Ottawa	13460	8218	67	61.06
St. Patrick's Orphan Asylum	do	21197	10577	53	49.89
St. Joseph's Orphan Asylum	do	36559	5637	86	15.15
Roman Catholic Orphans' Home	London	35857	†	.....	.....
Protestant Orphans' Home	do	17853	†	.....	.....
Protestant Home (Orphanage Branch)	St. Catharines	10413	*2086	62	.....
Orphan Asylum	St. Agatha	13487	1118	64	8.51
The Home (Orphanage Branch)	St. Thomas	513	†	.....	.....
Orphan Asylum	Fort William	11145	2012	78	18.06
Totals		623801	99142	90	.....

* Includes expenditure of Refuge Branch.

† Included with Refuge Branch.

SEPARATE REPORTS.

ROMAN CATHOLIC ORPHAN ASYLUM, TORONTO.

The following summaries shew the operations of this Orphanage during the year:—

Movements of Inmates.

In residence, 1st October, 1885	281	
Admitted	202	
Total number of inmates		483
Discharged	184	
Died	19	
In residence, 30th September, 1886	280	
		483

Sex.

Male	253	
Female	230	
		483

Religious Denominations.

Protestant	16	
Roman Catholic	467	
		483

Nationalities.

Canadian	354	
English	29	
Irish	82	
United States	10	
Other countries	8	
		483

Places admitted from.

City of Toronto	298	
County of York	39	
Other parts of Ontario	85	
Other countries	61	
		483

The receipts of the Institution during the year, including the Government grant of $1,952.70, were $8,741.93, and the expenditures were $8,736.50.

The collective stay of the inmates was 104,277 days, entitling the Institution to receive the sum of $2,085.54, as Government aid for the year 1887.

Inspections.

Copies of the reports made to the Government by me upon this Orphanage are annexed:—

"I made an inspection of the Roman Catholic Orphanage, Toronto, on the 15th March.

"The number of youths under charge in the House of Providence building on that date was 181. Those of a school age were assembled in the class-rooms, and presented a neat and clean appearance. They were reported to be making good progress. The younger children were comfortably domiciled in the upper storey of the building, and appeared to be receiving every attention."

"On the 14th October, I made another inspection of the Roman Catholic Orhpanage, Toronto. This was my first official visit to this Orphanage since the new buildings at Sunny Side have been occupied. There were 148 boys in residence on the day of my visit, and 133 girls still remain at the House of Providence in the city, where they are for the present provided for. I had an opportunity of seeing the children at the latter Institution in their classes in the school-rooms on the occasion of my visit on the 1st of September last. In both cases the youths appeared to be well cared for. They were comfortably clad, and clean in appearance.

"The property at Sunny Side was purchased some years ago with the view of erecting buildings thereon for this Orphanage, which was originally located on Jarvis Street. After that building had become dilapidated and unfit for occupancy, the children were accommodated in the House of Providence till the present buildings could be erected.

"The new buildings which has been attached to the residence purchased with the property, is 85 by 44 feet, four storeys high, including the basement; the property has cost $20,000. All necessary modern appliances required for such an Institution are utilized in the new building. It is heated with hot water, and the dormitories are light, airy, and well ventilated.

"The situation of the new building is all that could be desired, and the general internal arrangements are well adapted to the purposes of such an Institution."

ORPHANS' HOME, TORONTO.

The following summaries shew the operations of this Institution during the past year:—

Movements of Inmates.

In residence, 1st October, 1885	145	
Admitted	93	
Total number of inmates		238
Discharged	66	
Died	1	
In residence, 30th September, 1886	171	
		238

Sex.

Male	131	
Female	107	
		238

Religious Denominations.

Protestant	238	
		238

Nationalities.

Canadian	180	
English	50	
Irish	4	
Other countries	4	
	——	238

Places admitted from.

City of Toronto	221	
County of York	1	
Other parts of Ontario	15	
Other countries	1	
	——	238

The receipts of the Institution during the year, including the Government grant of $1,077.26, were $9,185 45, and the expenditures were $10,196.08

The collective stay of the inmates was 58,274 days, entitling the Institution to receive the sum of $1,165.48, as Government aid for the year 1887.

INSPECTIONS.

Copies of the reports made to the Government by me upon this Orphanage are annexed:—

"The Protestant Orphans' Home was inspected by me on the 10 March. There were then in residence 81 boys and 74 girls, a total of 155; 130 of these were in the classes in the school-room. I found that another teacher had been added to the staff and that by an equal division of the classes the work of the school-room was being carried on more advantageously. The children were seen and all appeared to be in good health and well cared for.

"I was informed that, through the generosity of Mr. Wm. Gooderham, who takes a deep interest in this, as well as in other charitable institutions in the city, the managers have been afforded the means for fitting up the spare room in the upper flat of the building, thus providing accommodation for thirty children from three to five years of age. This is a most desirable addition to the Home.

"The building was in its usual state of cleanliness and good order."

"My second inspection of the Orphans' Home, Toronto, was made on the 31st August. I saw all the children then being cared for, 104 boys and 79 girls. The large increase in the number of inmates since the date of my last visit has been a noticeable feature in the work of this Institution, and the ample and excellent accommodation provided are a sufficient guarantee of the efforts that have been and are being made on behalf of the destitute of the city.

"The Home was in its usual condition of excellent order.

"A large number of the children were pursuing their studies in the school-room at times of my visit."

GIRLS' HOME, TORONTO.

The following summaries shew the operations of this Home during the year:—

Movements of Inmates.

In residence, 1st October, 1885	76	
Admitted	46	
Total number of inmates	——	122

Discharged	40	
Died	1	
In residence, 30th September, 1886	81	
		122
Sex.		
Male	13	
Female	109	
		122
Religious Denominations.		
Protestant	118	
Roman Catholic	4	
		122
Nationalities.		
Canadian	108	
English	9	
Irish	2	
United States	2	
Other countries	1	
		122
Places admitted from.		
City of Toronto	118	
Other parts of Ontario	4	
		122

The receipts during the year, including the Government grant of $594.64, were $5,324.80, and the expenditures incurred were $5,322.23.

The collective stay of the inmates was 30,447 days, entitling the Institution to receive the sum of $608.94 as Government aid for the year 1887.

INSPECTION.

Copies of the reports made to the Government by me upon this Home are annexed:—

"I visited the Girls' Home, Toronto, on the 2nd March. There were then 89 children, 13 boys, 76 girls, in the Home, all of whom were seen by me. The structural alterations and improvements made in the building have contributed very materially to the well being of the inmates.

"The Home was in a state of excellent order and cleanliness throughout, and with proper care and treatment all traces of the ailments which had been prevalent amongst the children, were in a fair way to be eradicated.

"I made another visit to the Girls' Home, Toronto, on the 30th August. There were then in residence 68 girls, and 8 boys. It is the intention of the management hereafter to provide for female children only, and the boys now in charge will be gradually removed as soon as they can be provided for elsewhere.

"I found that considerable improvement has taken place in the condition of the children, since the date of my last visit, a much smaller number of them being isolated on account of the skin disease which has prevailed for some time. Since the reconstruction and improvement of the building, the general health appears to be very much better.

"The dormitories and the apartments of the Institution generally, I found to be thoroughly clean and well kept."

BOYS' HOME, TORONTO.

The following summaries shew the operations of the Home during the year :—

Movements of Inmates.

In residence, 1st October, 1885	87	
Admitted	73	
Total number of inmates		160
Discharged	50	
In residence, 30th September, 1886	110	
		160

Religious Denominations.

Protestant	155	
Roman Catholic	5	
		160

Nationalities.

Canadian	128	
English	18	
Irish	4	
Other countries	10	
		160

Places admitted from.

City of Toronto	123	
County of York	3	
Other parts of Ontario	22	
Other countries	12	
		160

The receipts of the Home during the year, including the Government grant of $624.70, amounted to $5,825.70, and the expenditures were $5,733.89.

The collective stay of the inmates was equal to 34,137 days, entitling the Institution to receive the sum of $682.74 as Government aid for the year 1887

Inspections.

Copies of the reports made to the Government by me upon this Home are annexed :—

"The Boys' Home, Toronto, was inspected by me on the 2nd March. It was in excellent order throughout, and the books were found to be regularly entered up.

"Eighty-six boys were under charge, all of whom were in excellent health, and were receiving the usual care observed under the good management of this Institution. A number of the boys were assembled in the school-room, and some were engaged in domestic works, while others were in the play-room. All appeared to be equally comfortable, and their conduct was represented to be uniformally good."

"My second statutory inspection of the Boys' Home, Toronto, was made on the 30th August. I saw the 104 youths then in residence. They were all bright and healthy in appearance. No case of illness existed, and there was every indication that the boys were the objects of the greatest care for their well being, both in regard to their physical and mental training. The Home was in its usual state of cleanliness and excellent order, and a thorough system of management was exhibited in every department.

"The rule observed in this Institution that all the supplies of clothing, etc., shall be made by the boys themselves is an excellent one, and worthy of the strongest commendation, not only as a measure of economy, but as an incentive to industrious habits. Drill and band practice were in progress at the time of my visit, and the lads shewed considerable proficiency in both. I was informed that their average progress in the school-room was also very satisfactory.

NEWSBOYS' LODGINGS, TORONTO.

The following summaries shew the operations of this Institution during the year :—

Movements of Inmates.

In residence, 1st October, 1885	26	
Admitted	85	
Total number of inmates		111
Discharged	88	
In residence, 30th September, 1886	23	
		111

Religious Denominations.

Protestant	96	
Roman Catholic	15	
		111

Nationalities.

Canadian	88	
English	18	
Irish	3	
Other countries	2	
		111

Places admitted from.

City of Toronto	62	
County of York	13	
Other counties	23	
Other countries	13	
		111

The income during the year, inclusive of the Government grant of $216.48, was $2,859.88, and the expenditures were $2,661.46

The collective stay of the boys was 10,364 days, entitling the Institution to receive the sum of $207.28 as Government aid for the year 1887.

Inspections.

Copies of the reports made to the Government by me upon this Institution are annexed :—

"I inspected the Newsboys' Lodgings, Toronto, on the 4th March. Thirty-two boys were registered as inmates, some of whom were receiving full board and lodging, and others only partial. At the time of my visit twenty-two of these boys were being served with a substantial mid-day meal. The house was in fair order and as well kept as might be expected considering its old and dilapidated condition.

"I found that the number of casual lodgers during the past winter had not been so large as formerly. The majority of those boys who were being sheltered at the date of my inspection had been in the place for a number of months."

"I again visited the Newsboys' Lodgings, Toronto, on the 31st August, and found the names of twenty-eight inmates entered upon the register, and it appeared from the record that quite a number of them had resided in the Institution for a length of time.

"No change was noticeable in regard to the building or its internal condition. The dormitories, furniture, bedding, etc., were moderately clean, but in character with the building, which in its entirety stands in much need of thorough renovation. A change in the Superintendency, I was informed, was about being made, and some confusion existed in consequence thereof."

THE INFANTS' HOME, TORONTO.

The following summaries shew the operations of this Home during the past year:—

Movements of Inmates.

	Infants.	Mothers.	Total.
In residence, 1st October, 1885	47	19	66
Admitted	84	31	115
Total number of inmates	131	50	181
Discharged	29	31	60
Died	75	00	75
In residence, 30th September, 1886	27	19	46
	131	100	181

The statistical information regarding the infants is as follows, viz:—

Sex.

Male	60	
Female	71	
		131

Religious denominations.

Protestant	121	
Roman Catholic	10	
		131

Nationalities.

Canadian	118	
English	7	
Irish	6	
		131

The statistical information regarding the 50 mother nurses is as follows :—

Religious denominations.		
Protestant	43	
Roman Catholic	7	
	——	50
Nationalities.		
Canadian	37	
English	7	
Irish	6	
	——	50
Places admitted from.		
City of Toronto	27	
Province of Ontario	15	
Other countries	8	
	——	50

The receipts of the Home during the year were $3,886.46, and the expenditures were $3,791.23.

The collective stay of the children equalled 14,148 days. The Home, therefore, will be entitled in respect of them to $282.96.

The collective stay of those mother nurses, for whom 10 cents a day is allowed, was 6,363 days. The Home, in respect to these, will be entitled to $636.30,

The collective days' stay of those mother nurses, for whom 7 cents per day is allowed, was 1,514 days, for which they are entitled to receive $105.98.

The total grant, therefore, to the Home for 1887, including the grant of $200 for the Infirmary work, will amount to $1,225.24.

Inspections.

Copies of the reports made to the Government by me upon this Home are annexed :

"My first visit during the official year to the Infants' Home, Toronto, was made on the 4th March. There were in the Institution on that date 61 infants and 30 mother nurses, all of whom seemed to be receiving proper and judicious care. Order and system are noticeable features in the management, and the Home in all departments was found to be in a very creditable condition.

"I found that since my previous visit a verandah projecting from the infirmary ward had been erected, making a great improvement. In this ward 11 infants were being cared for, each being isolated as much as the accommodation of the ward would permit.

"I visited the Infants' Home, Toronto, on the 30th August, and saw the 22 infants then being cared for, together with 17 mother nurses who were attending them. The number at present under charge is much reduced on account of admissions having to be refused lately, an epidemic of measles having broken out which assumed a typhoid form. The same disease, in a very virulent form, made its appearance in the Institution some months ago, and caused the death of 36 infants. During its prevalence every child, with the exception of four, was attacked. The disease was brought into the home by a foundling child, whose appearance at the time of its reception did not indicate that it was afflicted so

seriously. Since the disappearance of the last case the building has been thoroughly disinfected throughout, and every appliance used for removing the slightest apprehension of contagion.

"I found the apartments of the Institution in good order; the books also were properly and neatly kept.

"The experience of the past few months shews the importance of having an isolated building to be used as an infirmary at all such institutions. Had such a building been available in this instance, and the first case been removed there, undoubtedly a large number of lives would have been saved."

ST. NICHOLAS HOME, TORONTO.

The following summaries shew the operations of the Home during the official year:—

Movements of Inmates.

In residence, 1st October, 1885	46	
Admitted	120	
Total number of inmates		166
Discharged	112	
Died	1	
In residence, 30th September, 1886	53	
		166

Sex.

Male	166	

Religious Denominations.

Protestant	9	
Roman Catholic	157	
		166

Nationalities.

Canadian	104	
English	44	
Irish	11	
Other countries	7	
		166

Places admitted from.

City of Toronto	143	
Other places	23	
		166

The revenue of the Home during the year, including the Government grant of $270.74, was $3,824.01, and the expenditure was $3,791.81.

The collective stay of the boys was 15,900 days, entitling the Institution to receive the sum of $318.00 as Government aid for 1887.

INSPECTIONS.

Copies of the reports made to the Government by me upon this Home are annexed:—

"My first inspection of the St. Nicholas Home, Toronto, during the year was made on the 11th of March. On that day the names of twenty-three adult males and fifteen youths were registered as lodgers. There were only three of the inmates unemployed at the time of my visit. I found that a night school had been established for some months; considerable progress was shown in the writing of those attending it.

"The dormitories were found to be clean and neatly kept. The books also were in proper order."

"I made an inspection of the St. Nicholas Home, Toronto, on the 31st August. The register contained the names of fifty-one inmates, thirty-six of whom were classed as adults, and fifteen youths. The youths, I learned, were being instructed in the class-room, while those of more advanced age were absent at their various employments learning trades, etc. The books were well and neatly kept, and the dormitories and other departments of the Institution were in good order."

HOSPITAL FOR SICK CHILDREN.

The following summaries shew the operations of this Institution during the year:—

Movements of Inmates.

Under treatment, 1st October, 1885	28	
Admitted	115	
Total number of inmates	——	143
Discharged	93	
Died	9	
Under treatment, 30th September, 1886	41	
	——	143

Sex.

Male	57	
Female	86	
	——	143

Religious Denominations.

Protestant	135	
Roman Catholic	8	
	——	143

Nationalities.

Canadian	135	
English	6	
Irish	1	
Other countries	1	
	——	143

Places admitted from.

City of Toronto	114	
County of York	27	
Other counties and countries	2	
	——	143

In the Convalescent Home on the Island ninety-three children were admitted during the summer season, but the majority of these were patients transferred from the Hospital.

The income of the Hospital during the year amounted to $7,008.22, and the expenditures to $6,907.16.

The collective stay of the inmates, including those in the Island Home, requiring active medical or surgical treatment, was equal to 12,031 days, entitling the institution to aid to the extent of $1,804.65.

The collective stay of the children admitted to the Island Home as convalescents and from orphanages, etc., for change, was 1,556 days. The Hospital will be entitled in respect of them to an allowance of seven cents per day, equal to $108.92, making a total of $1,913.57 as Government aid for the year 1887.

Inspections.

Copies of the reports made by me to the Government upon this Hospital are annexed :—

"My first inspection of the Sick Children's Hospital during the year was made on the 3rd March. There were on that date thirty children under treatment, viz., eight boys and twenty-two girls. All the little patients appeared to be making favourable progress under the careful treatment they were receiving. I found the building to be in excellent order throughout, and the books properly kept.

"I was given to understand that arrangements were being made for the erection of a new building, and that a piece of ground adjoining the present premises had been secured, with a view to make it the permanent location of the Hospital."

"On the 18th June I made an inspection of the Lakeside Branch of the Hospital for Sick Children. There were forty-six children being cared for at the time of my visit, ten of whom were males and thirty-six females. Of these eight boys and twenty girls had been removed from the main hospital 10th June. The others had been admitted from the Girls' Home and the Home for Incurables. Those admitted from these institutions are not considered patients of the Hospital, but are granted a temporary residence on the Island with a view to improving their condition.

"The building was in excellent order, and every care appeared to be taken to promote to the well-being of the patients. The drainage seems to be the only drawback to the sanitary condition of the building, and if some means were devised for carrying the sewage to a greater distance, much improvement would no doubt be effected."

ST. MARY'S ORPHAN ASYLUM, HAMILTON.

The following summaries shew the operations of this Asylum during the year:—

Movements of Inmates.

In residence, 1st October, 1885	160	
Admitted	106	
Total number of inmates	——	266
Discharged	84	
Died	9	
In residence, 30th September, 1886	173	
	——	266

Sex.

Male	138	
Female	128	
	——	266

Religious Denominations.

Roman Catholic	261	
Protestant	5	
	——	266

Nationalities.

Canadian	207	
English	44	
Irish	5	
Other countries	10	
	——	266

Places admitted from.

City of Hamilton	97	
County of Wentworth	65	
Other counties and countries	104	
	——	266

Including the Government grant of $1,073.30, the revenue of the Asylum during the year amounted to $6,653.56, and the expenditures to $6,672.71.

The collective stay of the inmates was 62,555 days, entitling the Asylum to receive a sum of $1,251.10, as Government aid for 1887.

Inspections.

Dr. O'Reilly instructed Mr. Hayes to make the first inpection of this orphan Asylum. A copy of his report to Dr. O'Reilly is annexed:—

"As instructed by you, I inspected the St. Mary's Orphanage, Hamilton, on the 24th June. The house was not in quite such good order as is usual, owing to the fact that the Sisters had provided refreshments that morning for a large number of visitors who had come to Hamilton in connection with the first communion of their children. The dormitories were, however, clean and neat.

"An addition to the building is in course of construction; indeed it is nearly finished. The wing is 24 feet by 30 feet and three storeys in height. The upper

storey is to be used as a dormitory and the two lower ones as a laundry and drying-room. The old laundry has been fitted up part as a refectory for the children and part as a refectory for the few men who are on the premises.

"The names of 82 children were on the register, all of whom were seen with the exception of three boys away in Dundas."

The following is a copy of the report made by Dr. O'Reilly to the Government:—

"The St. Mary's Orphanage, Hamilton, was inspected by me on the 9th November. The children then in residence numbered 89, all of whom, judging from their appearances, receive proper care and attention.

"The addition referred to in a previous report upon this Home is now completed. It is well built and will increase the efficiency of the Institution, as well as add to its capacity. All parts of the building were in excellent order."

PROTESTANT ORPHAN ASYLUM, HAMILTON.

The following summaries shew the operations of this Asylum during the year:—

Movements of Inmates.

In residence, 1st October, 1885	34	
Admitted	5	
Total number of inmates		39
Discharged	13	
In residence, 30th September, 1886	26	
		39

Sex.

Male	33	
Female	6	
		39

Religious Denominations.

Protestant	39	
		39

Nationalities.

Canadian	33	
English	6	
		39

Place admitted from.

City of Hamilton	39	
		39

The receipts of the Asylum during the year were $4,334.80, and the expenditures were $4,359.06. The receipts and expenditures of the Aged Women's Refuge are included in these amounts.

The collective stay of the children was 10,677 days, entitling the Institution to receive the sum of $213.54 as Government aid for 1887.

INSPECTIONS.

Dr. O'Reilly, instructed Mr. Hayes to visit this Orphanage. A copy of the report made to Dr. O'Reilly upon it is annexed :—

"I beg to report that, as directed by you, I inspected the Protestant Orphans' Home, Hamilton, on the 24th June. There were then twenty-six boys and two girls on the books of the Asylum. The premises were neat and clean throughout and the children looked healthy and well cared for."

A copy of the report made to the Government by Dr. O'Reilly is annexed :—

"On the 9th November, I inspected the Protestant Orphans' Home, Hamilton, finding in residence twenty-two boys and five girls. The general health of the inmates of this Home is very good, and indeed there was no sickness amongst them during the past year."

"The building and yards were in fair order. The stairway leading from the nursery is not sufficiently protected and might be the cause of an accident."

BOYS' HOME, HAMILTON.

The following summaries shew the operations of this Home during the year :—

Movements of Inmates.

In residence, 1st October, 1886	91	
Admitted	30	
Total number of inmates		121
Discharged	22	
Died	1	
In residence, 30 September, 1886	98	
		121

Religious Denominations.

Protestant	121	
		121

Places admitted from.

City of Hamilton	121	
		121

Nationalities.

Canadian	10	
English	9	
Irish	2	
Scotch	3	
Other countries	97	
		121

The receipts of the Home during the year were $4,395.14, and the expenditures were $4,132.15.

The collective stay of the inmates was 34,566 days, entitling the House to receive the sum of $691.32 as Government aid for 1887.

INSPECTIONS.

Dr. O'Reilly instructed Mr. Hayes to make the first Inspection of this Home. A copy of his report made to Dr. O'Reilly is annexed:—

"As instructed by you I visited the Boys' Home, Hamilton, on the 6th June. The building was then in its usual excellent condition throughout. The walls of the upper dormitory have now been plastered making it more clean and comfortable.

"The ninety-three boys in residence were all seen. All were in good health."

A copy of the report made by Dr. O'Reilly, to the Government is annexed:—

"An Inspection of the Boys' Home, Hamilton, was made by me on the 9th November. The number of boys then being maintained was ninety-four. One of the most noticeable features about this house is the excellent health which as a rule prevails amongst the inmates. During the past year there was no sickness at all. Since the opening of the Home sixteen years ago, there have been only two deaths in it, one being the result of an accident. In the other case, the boy was brought in from the hospital in a dying state.

"The general condition of the building and of its surroundings was good.

"The books also were properly kept."

GIRLS' HOME, HAMILTON.

The following summaries shew operations of this Home during the year:—

Movements of Inmates.

In residence, 1st October, 1885	71	
Admitted	45	
Total number of inmates		116
Discharged	39	
In residence, 30th September, 1886	77	
		116

Sex.

Male	1	
Female	115	
		116

Religious Denominations.

Protestant	116	
		116

Nationalities.

Canadian	91	
English	15	
Irish	2	
Other countries	8	
		116

Places admitted from

City of Hamilton	109	
Other parts of the Province of Ontario	7	
		116

The revenue of the Home during the year was $2,834.42, and the expenditure was $2,885.59.

The collective stay of the children was 26.869 days, entitling the Home to receive a sum of $537.38 as Government aid for 1887.

INSPECTIONS.

Dr. O'Reilly instructed Mr. Hayes to visit this Home. A copy of the report made upon it is annexed:—

"In accordence with your instructions, I inspected the Girls' Home, Hamilton, on the 24th June.

"The building was in very good order, and the children to the number of 72 seemed to be healthy and well cared for. I saw them both in the school-rooms and at their mid-day meal. The new school-room, which is detached from the main building, has been well fitted up. The basement can be used as a play-room. The old school-room in the main building is also available for a similar purpose.

"The president and secretary of the Home, and also the architect, were at the building during my inspection, and we discussed the question of outside fire escapes, and finally decided upon what I believe to be an efficient scheme. When it is carried out there will be an outside stairway at each end of the building, and an inside one in the centre.

"The books are properly kept."

A copy of the report made to the Government by Dr. O'Reilly is annexed:—

"I made an inspection of the Girls' Home, Hamilton, on the 9th November. The children in residence numbered 80, and were all at dinner at the time of my visit.

"The building generally was in a satisfactory condition."

ORPHANS' HOME, KINGSTON.

The following summaries shew the operations of the Institution during the year:—

Movements of Inmates.

In residence, 1st October, 1885	54	
Admitted	17	
Total number of inmates		71
Discharged	15	
In residence, 30th September, 1886	56	
		71

Sex.

Male	33	
Female	38	
		71

Religious Denominations.

Protestant	71	
		71

Nationalities.

Canadian	51	
English	14	
Other countries	6	
		71

Places admitted from.

City of Kingston		71

The revenue of the Home during the year was $2,906.79, including the Government grant of $449.10, and the expenditure was $3,104.63.

The collective stay of the chidren was 17,554 days, entitling the Institution to receive a sum of $351.08, as Government aid for 1887.

INSPECTIONS.

Copies of the reports made to the Government by me upon this Home are annexed:—

"An inspection of the Orphans' Home, Kingston, was made by me on the 1st April. The children then under care numbered 28 of each sex, 56 in all. They were all seen, and with one exception were all in good health.

"An epidemic of scarlet fever broke out among the children during the autumn of 1885, and one death resulted therefrom. No traces of ailment were, however, noticeable at the time of my visit, as a consequence of this visitation of fever, and the children all seemed bright and happy."

"I made an inspection of the Orphans' Home, Kingston, on the 9th September, and saw all the children then under charge, 57 in number. Their appearance indicated that they were receiving the best of attention and consideration from the matron and her subordinates. They were all in good health and excellent spirits.

"The Home was in its usual condition of good order and cleanliness. The books were also well and neatly kept."

ORPHANAGE OF THE HOUSE OF PROVIDENCE, KINGSTON.

The following summaries shew the operations of this Orphanage during the year:—

Movements of Inmates.

In residence, 1st October, 1885	23	
Admitted	28	
Total number of inmates		51
Discharged	36	
In residence, 30th September, 1886	15	
		51

Sex.

Male	51	
		51

Religious Denominations.

Protestant	1	
Roman Catholic	50	
		51

Nationalities.

Canadian	41	
Irish	2	
Other countries	8	
		51

Places admitted from.

City of Kingston	10	
County of Frontenac	2	
Other counties	39	
		51

The receipts and expenditures of the Orphanage are included with those of the House of Providence, and cannot be shewn separately.

The collective stay of the children was 7,826 days, entitling the Orphanage to receive the sum of $156.52, as Government aid for 1887.

INSPECTIONS.

Copies of the reports made to the Government by me upon this Orphanage are annexed :—

"I inspected the orphanage of the House of Providence on the 1st April. The names of 19 children were entered on the register of inmates. An inspection of these children shewed them to be in good health and comfortably cared for."

"I again visited the House of Providence Orphanage, Kingston, on the 9th September, and found that there were 10 youths then being cared for, all of whom were evidently properly attended to. The books were in satisfactory order."

HOTEL DIEU ORPHAN ASYLUM, KINGSTON.

The following summaries shew the operations of this Asylum during the year :—

Movements of inmates.

In residence, 1st October, 1885	36	
Admitted	173	
Total number of inmates		209
Discharged	172	
In residence, 30th September, 1886	37	
		209

Sex.

Male	96	
Female	113	
		209

Religious Denominations.

Roman Catholic	206	
Protestant	3	
	——	209

Nationalities.

Canadian	54	
English	139	
Other countries	16	
	——	209

Places admitted from.

City of Kingston	36	
County of Frontenac	21	
Other counties and countries	152	
	——	209

The income of the Asylum during the year amounted to $867.00, and the expenditure to $1,196.40.

The collective stay of the inmates was equal to 14,259 days, thus entitling the Institution to receive the sum of $285.18 as Government aid for 1887.

INSPECTIONS.

Copies of the reports made to the Government by me upon this Orphanage are annexed :—

"On the 1st April I inspected the Hotel Dieu Orphanage, Kingston, and saw all the children then in charge, numbering 36. They bore a neat and cleanly appearance, and were evidently well cared for. The register I found to be correctly entered up."

"The Hotel Dieu Orphanage, Kingston, was again visited by me on the 9th September. There were then 42 children being maintained, all of whom appeared healthy and well cared for. The apartments of the Orphanage were in good order, and the books properly kept."

ORPHANS' HOME, OTTAWA.

The following summaries shew the operations of this Home during the year :—

Movements of inmates.

In residence, 1st October, 1885	38	
Admitted	43	
Total number of inmates	——	81
Discharged	43	
Died	6	
In residence, 30th September, 1885	32	
	——	81

Sex.

Male	28	
Female	53	
	——	81

Religious Denominations.

Protestant	77	
Roman Catholic	4	
	——	81

Nationalities.

Canadian	51	
English	9	
Irish	14	
Scotch	3	
Other countries	4	
	——	81

Places admitted from.

City of Ottawa	56	
County of Carleton	6	
Other countries	19	
	——	81

The revenue of the Home was $7,914.92, and the expenditures were $8,218.67.

The collective stay of the children was equal to 13,460 days, thus entitling the Institution to receive the sum of $269.20 as Government aid for 1887.

INSPECTION.

A copy of the report made to the Government by me upon this Orphanage is annexed :—

"I made an inspection of the Orphans' Home, Ottawa, on the 21st September, and was informed that there were 29 children in residence. I could not find, however, that any record had been kept of the number of inmates, such as is required by the departmental regulation.

"The children I saw were all well. They were still occupying the old building; but, I understand, they expect to take possession of the new one at an early day. This building will, in all departments, be admirably adapted to the requirements of the Institution."

ST. PATRICK'S ORPHAN ASYLUM, OTTAWA.

The following summaries shew the operations of this Asylum during the year :—

Movements of Inmates.

In residence, 1st October, 1885	51	
Admitted	66	
Total number of inmates	——	117
Discharged	60	
Died	1	
In residence, 30th September, 1886	56	
	——	117

Sex.

Male	60	
Female	57	
	——	117

Religious Denominations.

Protestant	3	
Roman Catholic	114	
	——	117

Nationalities.

Canadian	44	
English	10	
Irish	63	
	——	117

Places admitted from.

City of Ottawa	64	
Other parts of the Province	53	
	——	117

The income of this Orphanage was $11,774.20, inclusive of the Government grant, and the expenditure $10,577.53.

The collective stay of the children was equal to 21,197 days, entitling the Institution to receive the sum of $423.94 as Government aid for 1887.

INSPECTIONS.

Copies of the reports made to the Government by me upon this Orphanage are annexed :—

"I visited the St. Patrick's Orphanage, Ottawa, on the 6th May, when there were sixty children in residence. They were all in good health, clean in appearance and neatly dressed. The place was in good order throughout."

"I made an inspection of the St. Patrick's Orphanage, Ottawa, on the 21st September.

"There were sixty-one youths under charge, all of whom I saw, and whose appearance indicated that due attention was given to their wellfare. All those of school age were reported to be making reasonable progress, and those who were capable were also being instructed in household duties with a view of fitting them for positions where they can make their own way in the world."

ST. JOSEPH'S ORPHAN ASYLUM, OTTAWA.

The following summaries shew the operations of this Charity during the year :—

Movements of Inmates.

In residence, 1st October, 1885	101	
Admitted	85	
Total number of inmates	——	186
Discharged	90	
In residence, 30th September, 1886	96	
	——	186

Sex.

Male	77	
Female	109	
	——	186

Religious Denominations.

Roman Catholic		186

Nationalities.

Canadian	169	
Irish	17	
		186

Places admitted from.

City of Ottawa	115	
County of Carleton	47	
Other counties and places	24	
		186

The receipts of the institution were $5,673.99, and the expenditures $5,637.86.

The collective stay of the chidren was 36,559 days, entitling the Asylum to receive the sum of $731.18 as the Government aid for 1887.

INSPECTIONS.

Copies of the reports made to the Government by me upon this Asylum are annexed :—

"An inspection of the St. Joseph's Orphanage, Ottawa, was made by me on the 6th May. The 99 children then being cared for were seen by me. Judging from their appearance they were in excellent health, and while being somewhat demonstrative in the bouyancy of their spirits, there was no indication of unruliness or want of proper control over them."

"The books of record were found to be neatly kept and correct."

"I inspected the St. Joseph's Orphanage, Ottawa, on the 21st September, and saw the 88 youths and 7 adult females then under charge. The children were all well, and appeared to have every necessary care bestowed upon them. The books were neatly kept, as usual.

"A large airy play-room for the boys has been erected in rear of the Institution, and it is evidently well appreciated by them."

ROMAN CATHOLIC ORPHANS' HOME, LONDON.

The following summaries shew the operations of this Orphanage during the year :—

Movements of Inmates.

In residence, 1st October, 1885	95	
Admitted	65	
Total number of inmates		160
Discharged	63	
Died	3	
In residence, September, 1885	94	
		160

Sex.

Male	84	
Female	76	
	——	160

Religious Denominations.

Roman Catholic	149	
Protestant	11	
	——	160

Nationalities.

Canadian	148	
Irish	12	
	——	160

Places admitted from.

City of London	60	
Other parts of Ontario	100	
	——	160

The receipts and expenditures of this Home are included with those of the House of Refuge.

The collective stay of these children was 35,857 days, entitling the Asylum to receive the sum of $717.14 as Government aid for 1887.

INSPECTION.

A copy of the report made upon this Orphanage to the Government by Dr. O'Reilly, is annexed:—

"On the 15th September I made an inspection of the Roman Catholic Orphans' Home, London. I found that 99 children were cared for under its roof. The premises were as usual in a satisfactory condition.

"The books were examined and found to be properly kept."

PROTESTANT ORPHANS' HOME, LONDON.

The following summaries shew the operations of this Charity during the year:—

Movements of Inmates.

In residence, 1st October, 1885	50	
Admitted	37	
Total number of inmates	——	87
Discharged	39	
In residence, 30th September, 1886	48	
	——	87

Sex.

Male	55	
Female	32	
	——	87

Religious Denominations.

Protestant	87	
	——	87

Nationalities.

Canadian	74	
English	12	
Irish	1	
	——	87

Places admitted from.

City of London	87	
	——	87

The receipts and expenditures of this Home are included with those of the Home for the Aged and Friendless, London.

The collective stay of the children was 17,853 days, entitling the Institution to receive the sum of $357.06 as Government aid for 1887.

INSPECTIONS.

A copy of the report made to the Government upon this Orphanage by Dr. O'Reilly is annexed :—

"An inspection of the Protestant Orphans' Home, London, was made by me on the 17th May. The inmates were fifty-one children, two men and seven women.

"I found the Institution to be in a very satisfactory condition of cleanliness and order."

"I made a second inspection of the Protestant Orphans' Home, London, on the 15th September, when there were in resident fifty-one children, one man and seven women.

"The seats in the school-room of this Orphnage are of a bad pattern and should be replaced with those of a proper style. I hope the managers will soon be in a position to do this. In other respects the building was in good order, and the inmates seemed to be well looked after."

PROTESTANT HOME (ORPHANAGE BRANCH), ST. CATHARINES.

The following summaries shew the operations of this Charity during the year :—

Movements of Inmates.

In residence, 1st October, 1886	28	
Admitted	11	
Total number of inmates	——	39
Discharged	9	
In residence, 30th September, 1886	30	
	——	39

Sex.

Male	27	
Female	12	
	——	39

Religious Denominations.

Protestant	39	
	——	39

Nationalities.

Canadian	24	
English	7	
Irish	5	
Other countries	3	
	——	39

Places admitted from.

City of St. Catharines	32	
County of Lincoln	7	
	——	39

The revenue and expenditure of the Home during the year amounted to $1,842.81 and $2,086.61, respectively. The receipts and expenses connected with the Refuge Branch of the Home are also included in these sums.

The collective stay of the children was 10,413 days, entitling the Institution to receive the sum of $208.26 as Government aid for 1887.

INSPECTIONS.

A copy of the report made to the Government upon this Home by Dr. O'Reilly is annexed:

"On the 12th May, the Protestant Home, St. Catharines, was visited by me. there were then thirty children and one adult in residence. There was one rather severe case of scarlet fever in progress at the time of my visit. Every means were being taken to prevent the spread of the disease by isolating the patient and keeping the other children as far as possible out of danger. It was satisfactory to find that the Matron was giving her personal attention to this case, entrusting the nursing to no one but herself.

"The Home was in its usual excellent condition of good order."

The second inspection was made by Mr. Hayes, who reported to Dr. O'Reilly as under:—

"As instructed by you, I made an inspection of the Protestant Home, St. Catharines, on the 23rd September. The Secretary had the register at her home, as she was making up from it the annual statistical return; I could not therefore check it. The daily record showed the population to be thirty children, one boy of sixteen and one man. These, with one or two exceptions, were all seen.

"The building throughout was in very good order."

ST. AGATHA'S ORPHAN ASYLUM, ST. AGATHA.

The following summaries shew the operations of this Asylum during the year:—

Movements of Inmates.

In residence, 1st October, 1885	36	
Admitted	8	
Total number of inmater	——	44
Discharged	6	
In residence, 30th September, 1886	38	
	——	44

Sex.

Male	29	
Female	15	
	——	44

Religious Denomination.

Romon Catholic	44	
		44

Nationality.

Canadian	44	
		44

Places admitted from.

Village of St. Agatha	42	
County of Waterloo	1	
Other counties	1	
		44

The revenue of the Asylum was $1,120.64, including the Government grant of $271.16, and the expenditures were $1,118.64.

The collective stay of the children was 13,487 days, entitling the Asylum to receive the sum of $269.74 as Government aid.

INSPECTIONS.

Dr. O'Reilly instructed Mr. Mann to visit this Orphanage. A copy of the report made upon it is annexed :—

"As directed by you, I inspected the St. Agatha Orphan Asylum on the 10th August, when there were 25 boys, and 13 girls in residence. They were all found to be in good health.

"I looked through the books, which were well and properly kept. The building was in excellent condition throughout."

THE HOME (ORPHANAGE BRANCH), ST. THOMAS.

The following summaries shew the operations of this Charity during the year :—

Movements of Inmates.

In residence, 1st October, 1885	3	
Admitted	3	
Total number of inmates		6
Discharged	6	
In residence, 30th September, 1886	..	
		6

Sex.

Male	2	
Female	4	
		6

Religious Denominations.

Protestant	6	
		6

Nationality.

Canadian	6	
		6

Place admitted from.

City of St. Thomas	6	
	——	6

The receipts and expenditures are included with those of the Refuge.

The collective stay of the children was 513 days, entitling the Home to receive the sum of $10.26, as Government aid for 1887.

The report upon this Orphanage is included with that upon the St. Thomas Home.

THE ORPHANS' HOME, FORT WILLIAM.

The following summaries shew the operations of this Home during the year :—

Movements of Inmates.

In residence, 1st October, 1885	14	
Admitted	28	
Total number of inmates	——	42
Discharged	5	
Died	1	
In residence, 30th September, 1886	36	
	——	42

Sex.

Female	42	
	——	42

Religious Denomination.

Roman Catholic	42	
	——	42

Nationality.

Canadian	42	
	——	42

Places admitted from.

Port Arthur	28	
From other parts of Ontario	6	
Foreigners	8	
	——	42

The revenue of the Orphanage was $1,270.25, excluding the Government grant of $136.40, and the expenditure $2,012.78.

The collective stay of the children was 11,145 days, entitling the Institution to receive the sum of $222.90, as Government aid for 1887.

Inspections.

A copy of the report made to the Government by Dr. O'Reilly upon this Orphanage is annexed :—

"I made an inspection of the Orphans' Home, Fort William, on the 25th August, when I found 40 children being maintained. The school-room in which these children were taught is but poorly equipped; the seats are of a bad pattern, and there is a lack of books and maps. I hope the authorities will be able to supply these deficiencies. In other respects, the building was in good order, and the children seemed to be properly cared for."

MAGDALEN ASYLUMS.

The first Table connected with this part of the Report shows the operations of each of the Institutions coming under this head.

Names of Magdalen Asylums.	Location.	No. of persons in residence on 1st October, 1885.	No. admitted during the year 1886.	Total number under lodgment during the year.	No. of discharges during the year.	No. of deaths during the year.	No. in residence 30th September, 1886.
Industrial Refuge	Toronto	27	58	85	56	2	27
Good Shepherd Refuge for Fallen Women	"	41	39	80	36	1	43
Home for Friendless	Hamilton	14	68	82	52	12	18
Good Shepherd Magdalen Asylum	Ottawa	75	67	142	52	1	89
Women's Refuge and Infants' Home	London	15	55	70	48	10	12
Totals		172	289	459	244	26	189
Totals in 1885		177	260	437	249	12	176

For convenience of comparison, I have attached to the table in question, figures shewing the total operations of these Institutions during the preceding year. A comparison will shew that there was a slight increase in the number of persons maintained during 1886.

The statistics from each Asylum, in respect of sex, religious denominations, nationalities and previous residences of the inmates, have been summarized as under :—

Sex.

*Male	63	
Female	396	
		459

Religious Denominations.

Protestant	198	
Roman Catholic	261	
		459

Nationalities.

Canadian	200	
English	64	
Irish	145	
Scotch	42	
United States	4	
Other countries	4	
		459

Previous Residence.

Received from city or town in which institutions are located	366	
Received from counties in which institutions are located	12	
Received from other counties in the Province	44	
Emigrants and foreigners	37	
		459

The next table shews the aggregate stay of the inmates of each Institution, the revenue, and the amount of the Government grant for the year 1887. Following that is one exhibiting the total expenditure for maintaining the Institutions and the average cost per inmate per day. In each case the totals of the similar tables in the report of the preceding year are given.

Following the tables referred to are the separate reports upon each Institution.

*Infants admitted to the Women's Refuge and Infants' Home, London, and Home for the Friendless, Hamilton.

NAMES OF MAGDALEN ASYLUMS.	Location.	Aggregate days' stay of inmates.	Total expenditure for maintenance during the year.	Aggregate cost per inmate per day.
			$ c.	Cents.
Industrial Refuge	Toronto	10879	3544 59	32.58
Good Shepherd Refuge for Fallen Women	"	15888	6809 20	42.85
Home for Friendless	Hamilton	8622	1911 64	22.17
Good Shepherd Magdalen Asylum	Ottawa	28305	6451 33	22.80
Women's Refuge and Infants' Home	London	5847	1326 19	22.68
Totals		69541	20042 95	28.82
Totals in 1885		66641	17995 89	27.00

NAMES OF MAGDALEN ASYLUMS.	Location.	Aggregate days' stay of inmates.	Amount received from all sources other than Government.	Total Government grant for the year 1887 at the rate of two cents per day.
			$ c.	$ c.
Industrial Refuge	Toronto	10879	4077 45	217 58
Good Shepherd Refuge for Fallen Women	do	15888	6540 24	317 76
Home for Friendless	Hamilton	8622	1619 70	172 44
Good Shepherd Magdalen Asylum	Ottawa	28305	5477 88	566 10
Womans' Refuge and Infants' Home	London	5847	652 90	116 94
Totals		69541	18368 17	1390 82
Totals in 1885		66641	16871 41	1332 82

SEPARATE REPORTS.

INDUSTRIAL REFUGE, TORONTO.

The following summaries shew the operations of this Institution during the year:—

Movements of Inmates.

In residence, 1st October, 1885	27	
Admitted	58	
Total number of inmates		85
Discharged	56	
Died	2	
In residence, 30th September, 1886	27	
		85

Religious Denominations.

Protestant	60	
Roman Catholic	25	
		85

Nationalities.

Canadian	18	
English	23	
Irish	35	
Scotch	6	
Other countries	3	
		85

Place admitted from.

City of Toronto	85	
		85

The revenue of the Asylum, exclusive of the Government grant of $245.68 amounted to $4,077.45, and the expenditures to $3,544.59.

The collective stay of the inmates was to 10,879 days, entitling the Institution to receive the sum of $217.58 as Government aid for 1887.

Inspections.

Copies of the reports made to the Government by me upon this Institution are annexed:—

"The Industrial Refuge, Toronto, was inspected by me on 4th March. There were 33 inmates. Those who were physically fit for work were actively employed in the laundry and the sewing-room. No change worthy of note with regard to this Institution has taken place since the date of my previous visit.

"The building was in good order and the books properly kept."

"I made a second inspection for the current year of the Industrial Refuge, Toronto, on the 30th August, and saw the 29 inmates then in residence. They were employed at laundry-work, knitting, sewing, etc., and the internal management appeared to be correctly carried out. The books I found to be properly kept."

GOOD SHEPHERD REFUGE FOR FALLEN WOMEN, TORONTO.

The following summaries shew the operations of this Refuge during the year:—

Movements of Inmates.

In residence, 1st October, 1885	41	
Admitted	39	
Total number of inmates		80
Discharged	36	
Died	1	
In residence, 30th September, 1886	43	
		80

Religious Denominations.

Protestant	3	
Roman Catholic	77	
		80

Nationalities.

Canadian	38	
English	14	
Irish	22	
Other countries	6	
		80

Places admitted from.

City of Toronto	60	
County of York	3	
Other counties and countries	17	
		80

The income of this Charity, exclusive of the Government grant of $268.96, was $6,540.24 and the expenditure $6,809.20.

The collective stay of ths inmates was 15,888 days, entitling the Institution to receive the sum of $317.76 as Government aid for 1887.

Inspections.

Copies of the reports made to the Government by me upon this Institution are annexed :—

"I visited the Good Shepherd Refuge, Toronto, on the 10th March, when there were in residence forty-five adult women and three girls. The premises were in excellent order and perfectly clean. I found that the structural additions to the building had been completed, and that the laundry operations, which form a source of considerable revenue to the Institution, had been largely extended."

"I made a second visit of inspection to the Good Shepherd Refuge, Toronto, on the 31st August. On that date there were fifty adult inmates and two youths in residence. The inmates were busily employed in laundry and needle-work, the demand for which I was informed was steadily increasing. The Institution was thoroughly clean and tidy in appearance."

HOME FOR THE FRIENDLESS, HAMILTON.

The following summaries shew the operations of this Home during the year :—

Movements of Inmates.

In residence, 1st October, 1885	14	
Admitted	68	
Total number of inmates		82
Discharged	52	
Died	12	
In residence, 30th September	18	
		82

Sex.

Males (infants)	33	
Female	49	
		82

Religious Denominations.

Protestant	71	
Roman Catholic	11	
		82

Nationalities.

Canadian	57	
English	19	
Irish	4	
Scotch	2	
		82

Places admitted from.

City of Hamilton	68	
Other places and counties	14	
		82

The revenue of the Home, exclusive of the Government grant of $183.00, was $1,619.70, and the expenditure $1,911.64.

The collective stay of the inmates was 8,622 days, entitling the Home to receive the sum of 172.44 as Government aid for 1887.

Inspections.

Dr. O'Reilly instructed Mr. Hayes to make the first inspection of this Home A copy of his report is annexed :—

"As instructed by you I made an inspection of the Home for the Friendless Hamilton, on the 24th June. The building was in fair order throughout.

"The Matron informed me that the authorities of the Home are very anxious to extend the building, so that an infirmary for infants may be established. Already, in a very limited space, a good deal of work is done in that direction, and I learned that so many young children have been sent to the Home of late that the outside laundry work has had to be given up, as the time of the adult inmates was fully occupied in the care of the infants. No doubt much good work could be done in such an infirmary, and be the means of saving many a life.

"On the day of my visit there were nine adults and fifteen children in residence."

A copy of the report made to the Government by Dr. O'Reilly is also annexed:—

"An inspection of the Home for the Friendless, Hamilton, was made by me on the 9th November. The inmates then being sheltered were twenty-two in number—six women and sixteen children.

"Since my last visit the house has been painted and very much improved in appearance.

"An infirmary wing is much needed, as frequently sick infants are brought into the Home, and they die for want of proper facilities for nursing."

GOOD SHEPHERD MAGDALEN ASYLUM, OTTAWA.

The following summaries shew the operations of this Asylum during the year:—

Movements of inmates.

In residence, 1st October, 1885	75	
Admitted	67	
Total number of inmates		142
Discharged	52	
Died	1	
In residence, 30th September, 1886	89	
		142

Religious Denominations.

Roman Catholic	138	
Protestant	4	
		142

Nationalities.

Canadian	74	
English	6	
Irish	54	
Scotch	3	
Other countries	5	
		142

Places admitted from.

City of Ottawa	59	
County of Carleton	37	
Other counties	14	
Other countries	32	
		142

The receipts of the Institution during the year, exclusive of the Government grant of $516,60, were $5,477.88, and the expenditures $4,012.42.

The collective stay of the inmates was 28,305 days, entitling the Institution to receive the sum of $566.10 as Government aid for 1887.

Inspections.

Copies of the reports made to the Government by me upon this Institution are annexed:—

"The Good Shepherd Magdalen Asylum, Ottawa, was visited by me on the 6th May, when there were 67 adults and 10 youths in residence.

"The place was in good order and the inmates were engaged in their usual occupations of laundry and needle-work."

"I again visited the Good Shepherd Refuge, Ottawa, on the 21st September.

"There were on that date 89 inmates, who were divided into four separate classes. The routine work of the Institution was being carried on as usual, the inmates being employed at laundry work, tailoring, etc. I found the books in proper order."

WOMEN'S REFUGE AND INFANTS' HOME, LONDON.

The following summaries shew the operations of this Charity during the year:—

Movements of Inmates.

In residence, 1st October, 1885	15	
Admitted	55	
Total number of inmates		70
Discharged	48	
Died	10	
In residence, 30th September, 1886	12	
		70

Sex.

Male (infants)	20	
Female	50	
		70

Religious Denominations.

Protestant	60	
Roman Catholic	10	
		70

Places admitted from.

City of London	57	
Counties in Ontario	4	
Other countries	9	
		70

The receipts during the year, exclusive of the Government grant of $118.58, were $652.90, and the expenditures $1,326.19.

The collective stay of the inmates was 5,847 days, entitling the Refuge to receive the sum of $116.94 as Government aid for 1887.

Inspections.

Copies of the report made to the Government upon this Home by Dr. O'Reilly is annexed:

"I made an inspection of the Women's Refuge and Infants' Home, London, on the 17th May, when there were 7 women and 13 children in residence.

"I was much pleased to find that the Home had been brightened up very considerably; it was cleaner and more prosperous looking than I had ever seen it before, and was in a very satisfactory condition. The books also were inspected and found to be correctly kept."

"A second inspection of the Women's Refuge, etc., London, during the official year was made by me on the 15th September. Its population was then 18, namely, 6 adults and 12 infants.

"The building was in good order."

REPORT

OF THE

COMMISSIONER OF PUBLIC WORKS

FOR THE

PROVINCE OF ONTARIO

FOR THE

YEAR ENDING 31ST DECEMBER,

1886.

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1887.

CONTENTS.

REPORT

OF THE

COMMISSIONER OF PUBLIC WORKS

FOR THE

PROVINCE OF ONTARIO,

FOR THE YEAR ENDING 31st DECEMBER, 1886.

To his Honour the Honourable JOHN BEVERLEY ROBINSON,

Lieutenant-Governor of the Province of Ontario, etc.

As required by the provisions of the Statute in that behalf, I beg to submit the report of the Works, etc., prosecuted under the control of the Public Works Department during the year 1886.

The accompanying report of the Architect of the Department will be found to contain full details of all operation in connection with the several Public Institutions.

The report of the Chief Engineer of the Department, appended hereto, furnishes like details in respect of Provincial locks, dams, slides, etc.

There will also be found in the last mentioned report a summary of the progress of railway construction throughout the Province, during the year just ended.

Since my last report suitable plans for the proposed new Provincial Parliament Buildings have been completed ; and a contract for certain of the works, etc., in connection with the erection and completion of these buildings has been entered into, subject to the same being ratified at the next session of the Legislative Assembly.

Very respectfully submitted.

C. F. FRASER,

Commissioner, etc.

DEPARTMENT OF PUBLIC WORKS, ONTARIO,
December 31st, 1886.

REPORT

THE ARCHITECT, ETC.

DEPARTMENT OF PUBLIC WORKS, ONTARIO,
TORONTO, December 31st, 1886.

SIR,—I have the honour to submit the following report with reference to the matters connected with the works on public buildings during the year.

GOVERNMENT HOUSE.

The residence and grounds have been kept in good order, repairs having been made as required. Several necessary articles of furniture and furnishing, principally for renewals, have been supplied. The expenditure on capital account has been trifling.

PARLIAMENT AND DEPARTMENTAL BUILDINGS.

Repairs have been made where required, and additional furniture and furnishings have been supplied, where necessary, for the several offices The grounds have been kept in good order.

ASYLUM FOR THE INSANE, TORONTO.

Mansard roofs were constructed at the eastern and western gate lodges, giving additional accommodation for the occupants, improvements which were very much required. The work was done by the day under the superintendence of the carpenter of the Department.

New tile drains were constructed from each lodge and from the green-house to the Queen Street sewer.

ASYLUM FOR THE INSANE, LONDON.

A roof was constructed over the large root house, as the brick arches were in a leaky condition.

The timbers supporting the water tank in the Laundry being in an unsound condition, were renewed.

A new concrete floor was constructed in the cow shed, the wooden floors and joists having been removed.

This work was done under the superintendence of the Permanent Clerk of Works.

ASYLUM FOR THE INSANE, HAMILTON.

The plans and specifications for the new South Cottage for 300 patients having been completed in accordance with last year's report, tenders were received for the whole work also for the steam heating, on the 4th of May last.

The tender of Messrs. J. & E. Dickenson, Hamilton, including the steam heating, being the lowest, was accepted, and the agreement duly executed.

The excavation was commenced in the latter part of May, under the superintendence of Mr. John Wheeler, Clerk of Works, and the work has been continued to the present time, though some delay has occurred owing to strikes amongst the workmen.

The west wing, kitchen and boiler house, have been roofed in and enclosed for the winter, the interior finishings being now in progress, and it is expected that the whole work will be completed on the 1st of September, 1887, as specified.

The foundations of the east wing have been constructed to the height of the ground floor, the joists of which have been laid and boarded over, so as to protect the basement walls from frost during the winter.

The main drain connecting with the sewer of the Asylum building, and most of the branch drains, have been constructed, and connections made with the foundations to keep them clear of water.

The main drain is of Hamilton tile pipe, 12 inches in diameter, extending to W.C.'s. The branch drains are of 9 and 6-inch tile pipes.

The plan of the new South Cottage will be similar in outline to the South Hospital at Middletown, Conn., with the exception of having dining-rooms on each storey, instead of two large dining-rooms on the ground floor, as arranged in the latter building in the rear on each side.

The upper storey for the Cottage at Hamilton will be finished the full height, instead of a half-storey as constructed at Middletown.

The new South Cottage will consist of a centre building and two wings, with a rear addition for the kitchen, scullery, store-rooms, boiler house, containing the steam heating and high pressure boilers.

The centre building will be 55 feet in front by 45 feet in depth, three storeys in height, the ground and second floor 11 feet and upper floor 12 feet, connected by a passage two storeys in height about 30 feet in length by 10 feet in width with the main portion, and wings.

This building will contain a reception room, office, dining-room, and apartments for the Chief Attendant on the ground floor, dormitories for the Assistant Physician on the second floor, and rooms for the male and female attendants on the third floor.

Each wing will be about 150 feet in length, 63 feet in width and three storeys in height, the two lower storeys being 11 feet and the upper story 12 feet in height.

Each floor will contain four associated dormitories, 22 feet square, dining-room 40 by 18, pantry 13 by 12, Attendants' room 17 by 10, day room in alcove of the corridors 26 by 22, bath and wash-room 16 feet square, clothes-room 14 by 10, water-closets 16 by 13, ten single dormitories about 10 by 7, with two stairways, dust shafts, closets, etc.

The corridors will be 12 feet in width with large windows at one end, and two verandahs opening off each day room, on the front, on each floor.

Each wing will afford accommodation for 150 patients, in all 300, each floor being arranged for 50 patients.

The wings will be connected by passages on the ground and first floors, 38 feet by 7 feet, off which the passage to the centre building in front will open.

The kitchen, connected by the pantries with the dining-rooms, will be 38 feet by 22 feet and 23 feet in height, lighted from the ceiling and two windows in the rear. The store-rooms 14 by 12 open off the scullery, 26 by 16 and 11 feet high.

The boiler house will be 37 by 24 and 18 feet in height, and coal vault 39 by 26, connected with the boiler house.

The basements will be reserved for heating purposes, with concrete floors, two feet of the upper portion of each corridor being enclosed as fresh air chambers, with openings at

each end to admit the fresh air, which will be heated by Bundy steam radiators at each range of openings, to the corridors and apartments in each wing.

The building will be heated on the indirect system, with a few direct steam radiators in the corridors and passages.

The boilers, three in number, are five feet in diameter, and fourteen feet long, containing 78 tubes, Fitzgibbon patent, the shells being of the best English steel, three-eighths of an inch in thickness, each boiler having been tested by cold hydraulic pressure 120 lbs. to the square inch.

Two of the boilers will be sufficient to heat the building, on the low pressure indirect system, the third boiler to be used for high pressure for steam cooking, and heating water for baths, etc.

The main steam pipe will be eight inches internal diameter, extending from each boiler to the centre line of the corridor, with branches four inches internal diameter to the extremity of each wing, and centre building. The main return pipes will be five inches internal diameter with three inch branches.

The wings will be heated by 64 Bundy indirect radiators, and the centre building by 6 Bundy radiators. The direct radiators in the passages being 24 in number, 20 loops, with automatic valves, etc.

The warm air from the duct under the ceiling of the corridor, as before explained, will pass through flues 10 ins. by 8 ins. in the walls with openings 7 feet from the floor into each apartment and corridor, and the foul air will be drawn off through 14 in. by 9 in. flues near the floor level which will pass directly up through the roofs as chimneys.

By these means the air in the apartments and corridors will be constantly changed, and the whole of the building thoroughly ventilated.

The wings will be supplied with water from a tank over each bath room, holding 4,000 gallons each, and the centre building will have a tank in the attic, which will hold 700 gallons, in all 8,700 gallons into which the water will be pumped from the main Asylum.

Fire plugs and hose will be provided on each floor for accidents from fire.

The water-closets will be placed next to the bath and wash rooms, in projections from each wing.

The fittings will be "Mott's triplex" patent with automatic seat, which has been thoroughly tested and approved at the Kingston Asylum.

The bath and wash rooms will be supplied with "Motts'" latest improved tubs and basins.

Separate ventilating shafts have been provided for each of the W. C. projections, in order to have these portions of the building perfectly ventilated.

The foundation walls have been built with stone quarried on the ground, and lined on the inside with brickwork, the interior walls being of brick.

The external walls of the west wing above the plinth at the ground floor line, have been built of brick, 20 inches in thickness, outside dimension, spaces two inches wide having been left in the centre of the wall with 9 inch brickwork on either side, bound together with iron clamps every fourth course and 2 feet apart. The outside portion is built with red mortar.

The centre building and east wing when built will be of similar construction.

The partition walls for internal work are all of brick.

Portland cement bases will be used in the wings throughout, also in the floors of the water closets, resting on iron beams and brick arches.

The floors throughout the building will be of hard maple, carefully selected, planed, tongued, grooved and twice oiled.

The sashes will be of oak with concealed pullies, and stops to prevent the sashes opening more than six inches.

The estimated cost of the building complete is $130 000.

Tenders were also received for the construction of slate roofs over the deck roofs of the main building, the tender of Messrs. J. & E. Dickenson, being the lowest, was accepted. The work was done in a satisfactory manner, the roofs being now quite water-tight and in good condition.

On the 31st of October last, a fire occurred in the drying room over the laundry in the rear addition, which destroyed the woodwork of the kitchen, laundry, drying and ironing rooms, also the roof over the Amusement Hall and attendants' rooms. The walls of the laundry and drying-room were so much injured, that they had to be taken down to the window-sills above the stonework of the basement.

The Northey pumps in the two boiler houses were sufficient to control the fire, with the assistance of the City Fire Brigade, and prevent its extension to the main building.

The fire was apparently accidental and could not be accounted for, as, being Sunday, there was no steam in the pipes of the drying-room, and the room was not in use by the attendants.

The Inspector of Insurance was duly notified, the building and contents having been insured, and Appraisers were appointed, who estimated the damage at $15,673.58 which amount has been paid.

The re-construction of these buildings at the earliest possible date, being an imperative necessity, instructions were given on the 1st of November to the contractors for the new cottage, who had workmen employed on the ground to clear away the refuse of the fire, and proceed with the work of re-construction under the Permanent Clerk of Works.

Workmen have been employed and materials furnished by the contractors, as previously reported, and the work will soon be completed and ready for use.

Some alterations were considered necessary by the Inspector of Prisons, etc., to increase the accommodation and to afford greater protection from accidents by fire, which have been made as suggested.

ASYLUM FOR THE INSANE, KINGSTON.

The work in connection with the re-construction of the steam heating of this Asylum was continued during this year, the whole work having been completed in a satisfactory manner by the Contractors, Messrs. McKelvey & Birch, Kingston, in sufficient time to have the same thoroughly tested before the steam heating apparatus was required in the autumn.

The addition in the rear of the building, the re-construction of the water-closets, and the alterations in the main building, Laundry, etc. were completed in the early part of the year, and are quite satisfactory.

The furniture has been supplied for the Chapel in the main building, and it is now used for services.

BRANCH ASYLUM, KINGSTON.

The arrangements made last year for the accommodation of 150 patients in this building, have been proved to be quite satisfactory, the building and grounds being in good condition.

A board fence was constructed at the south side of the grounds, for the better security of the patients.

ASYLUM FOR IDIOTS, ORILLIA.

Tenders for the construction of the steam heating, gas works and water supply for the new Cottages, and for the erection of a pumping engine and gas house, were received on the 4th of May last.

The tender of Messrs. Keith & Fitzsimmons for the steam heating, etc., and that of Mr. Damp for the pumping engine and gas house, being the lowest, were accepted.

The work on the Cottages, kitchen and boiler house was continued during the summer, the north Cottage, kitchen and boiler house having been built and roofed in, the basement and first storey of the south Cottage, was also built and covered in for the winter. The pumping engine and gas house were also built, and are now ready for the fitting up of the pumping engines, boilers, and gas apparatus, which are now on the ground. The main and branch drains were also constructed during the year.

The carpenter work in the north cottage, kitchen and boiler house will be continued during the winter, in order to commence the plastering early in the spring, the construction of the steam heating apparatus will also be continued, so as to complete the work of this Cottage before the end of June. The drains, with the exceptions of the connections with the down pipes, etc., have been constructed.

The gas and water pipes have been laid from the pumping engine and gas house to the boiler house, and the water tank in the tower, 120 feet above reservoir, has been constructed.

The reservoir and the two auxiliary wells for the development of the springs in the lower part of the farm were constructed early in the year, and the water supply has been tested and will furnish 70,000 gallons in 24 hours, an average of nearly 3000 gallons an hour, the quantity required for 200 patients at 50 gallons daily being 10,000 gallons.

The reservoir is 80 feet in length, 40 feet in width, and 5 feet in depth, supplying storage for 100,000 gallons of water.

The auxiliary wells are 15 feet in diameter, with three feet of water, one being 80 feet and the other 360 feet distant from the reservoir.

The sides of the reservoir and wells are walled with stone, and both reservoir and wells will be fenced in to prevent contamination.

Specimens of the water were sent to Dr. Ellis, the Public Analyst, for examination, and the following is a copy of extracts from his report:

"The samples of the water which you sent me for analysis from the Asylum spring and reservoir, and from Lake Simcoe opposite the Asylum, have been examined, and as you desired, both chemically and by the miscroscope. I enclose a comparison of the chemical analysis of the spring and Lake water. The spring water is of excellent quality, much preferable to that of the Lake." "I think the water supply for the new Asylum an excellent one."

The water will be pumped from the reservoir to the water tower by a pair of "Northey's" steam pumps calculated to discharge 10,000 gallons into the tank per hour.

The plans for the Cottages are in many respects similar to the Pennsylvania Training School at Elwyn, Delaware Co., but the main building when erected will be similar to the Illinois Asylum at Lincoln.

Each Cottage will be 143 feet in length, and about 60 feet in width, with projections at each end 33 feet in length by 17 feet in width, three storeys in height, with basements.

The ground floor in each Cottage will contain dining-room 55 feet by 35 feet, two work-rooms 28 by 25, scullery 26 by 18, pantry 18 by 14, sitting-room 18 by 10, two entrances 30 by 15, and six rooms 18 by 14 each, with projection for W.C. 16 by 12, and separate passage to same.

The staircases will be at each end with private stairway in the centre.

On the two upper floors there will be associated dormitories 68 by 46, four separat dormitories 12 by 10, day-room 55 by 35, bath and wash-room 18 by 16, clothes-room 18 by 10, Attendant's room 20 by 10, and Invalid's room 18 by 14, with projection for W.C. and separate passage as on ground floor.

Each storey will be 12 feet in height with basement 10 feet.

The Cottage will be heated by steam on the indirect system, from two boilers 14 feet long and 5 feet in diameter, 78 three inch tubes, with 52 Bundy radiators, 26 to each Cottage.

The high pressure boiler for steam cooking, etc., will be upright, 17 feet high and 4 feet in diameter, with 120 tubes 2 inches in diameter.

The Cottages have been placed 250 feet apart, the kitchen and boiler house being in the centre, between and equidistant from them.

The warm and foul air flues will be constructed in a similar manner to those already described for the Hamilton Cottage, with separate flues on each floor.

The kitchen and boiler house consist of a centre portion 80 by 40 and two wings 66 by 43, two storeys for kitchen portion, one storey for boiler house and basement 8 feet.

The basement will contain the Laundry and Bakery, each 40 by 37, and 20 feet high, three rooms 30 by 28, 8 feet high, boiler-house 40 by 38, and fuel vault 40 by 25 and 20 feet high.

On the ground floor is the kitchen 40 by 30, and 24 feet high, with a store-room 40 by 25, and 11 feet high, across a passage 40 by 7, and 11 feet high. The Laundry, Bakery and boiler house occupy the other portions.

On the upper floor is the ironing and drying rooms 40 by 37 and 12 feet in height, and store-room 40 by 33 and 12 feet high, the upper part of the kitchen, stairway, etc., occupying the remaining portion.

The water tower containing the tank to hold 16,000 gallons is 19 feet square, and 68 feet to the eaves above the ground line. It stands directly over the boilers so as to protect it from frost, and will supply the whole of the buildings with water.

The chimney of boiler house is 90 feet above the ground line and 8 feet square.

The estimated cost of the buildings, including land, is $130,000.

There has been no expenditure for repairs at the main Asylum, Orillia.

REFORMATORY FOR BOYS, PENETANGUISHENE.

Plans and specifications for the Warden's residence were made, and the work commenced in the latter part of May, the labor, except that of skilled workmen, having been supplied by the Reformatory Boys, and the materials were purchased by the Warden, except the stone for the foundations which were on the ground, the whole being under the control of the Inspector of Prisons.

The expenditure for "general repairs, etc.," has been small.

ANDREW MERCER REFORMATORY FOR FEMALES, TORONTO.

In this institution necessary repairs to the doors, window sashes and eaves, were made as required.

The services of the plumber employed by the Department were required on several occasions to repair the closets, drains, etc.

CENTRAL PRISON, TORONTO.

The cells in the basement of the centre building, in the space formerly used as a kitchen, were constructed by the labor of the prisoners, under the directions of the Warden and Inspector of Prisons, etc.

The plans and specifications were prepared in the Department, and the work has been done in a satisfactory manner. The ventilation of the cells by means of steam coils in the chimneys was tested and found quite efficient, fresh air being admitted to the corridor through openings in the west wall, and warmed by steam coils.

The plans for the reception cells on the ground floor, and for sundry alterations in the centre building were also prepared, and the work is now in progress under the Warden's directions, with the labor of the prisoners.

A fire occurred in the upper story of the centre building on the 28th of March last, the roof of the centre building having been destroyed, and other damages done which were assessed at $5,604.04, the buildings being insured.

Plans, etc., were prepared and the roof was reconstructed by the labor of the prisoners.

DEAF AND DUMB INSTITUTE, BELLEVILLE.

Tenders were received for the new water supply pipe and hydrants, and the tender of Messrs. Keith & Fitzsimmons being the lowest, was accepted.

The new pipe is of cast iron four inches internal diameter and leading from the pumping engine house to the tank in the centre building, with branches three inches in diameter to two hydrants for fire protection, in addition to the hydrants connected with the former water supply pipe two and a half inches in diameter, which is still connected with the pumps.

Five hundred feet of fire hose two and a half inches in diameter, with two hose carts, branches, etc., were also supplied.

The pipes and hose were thoroughly tested, and found to be quite satisfactory, the new supply pipe having been in constant use since the work was completed.

Some repairs were made to the roof and other portions of the Bursar's residence. The wharf which is generally used for landing coal for the Institute having been injured by severe storms during the high water in the spring, was also repaired.

BLIND INSTITUTE, BRANTFOND.

The painting of the outside woodwork of the main building, painting the brickwork, and other repairs, were done under the directions of the Principal and the Inspector of Prisons, etc.

AGRICULTURAL COLLEGE, GUELPH.

Drains were constructed from the down pipes in front of the building to the main drain and repairs were made as required, the work having been done under the directions of the Permanent Clerk of Works.

The details of construction for the new farm buildings having been decided on by the Advisory Board, after much consultation, the plans and specifications were prepared in the Department, with the assistance of Mr. Worden, an expert in such buildings, who was engaged for the purpose, and who made occassional visits of inspection during the progress of the work.

Tenders for their construction were received early in June, after due advertisement, and the tender of Mr. F. W. Schwendiman being the lowest was accepted.

The work progressed in a satisfactory manner under the superintendence of Mr. B. O'Byrne, Clerk of Works, and was completed and occupied during the autumn.

Tenders were also received in July for the construction of an addition to the coal house. The tender of Mr. Schwendiman being the lowest was accepted, and the work was completed in a satisfactory manner.

EDUCATIONAL DEPARTMENT AND NORMAL SCHOOL, TORONTO.

Sundry repairs were made and some of the rooms in the Educational Department were papered as required.

The Normal School or northern portion of the buildings were painted throughout, the walls colored and the ceilings calsomined, no expenditure for these purposes having been incurred for several years.

Constant repairs were required for the closets, and for the plumbing and steam-fitting throughout the buildings, which were attended to by the plumber of the Department during the past season, and some improvements are now being made in the steam heating apparatus which were much needed.

NORMAL SCHOOL, OTTAWA.

The usual repairs to the buildings and steam heating apparatus were made during the summer, the several school-rooms were painted, the desks cleaned and put in good order during the vacation. On the eve of opening the schools a fire occurred on the second floor in the corridor of the Model School, no person being in the building at the time. The fire was extinguished by the city fire brigade, with slight damage to the woodwork, the floors and ceilings were injured to the extent of $330.46, the amount assessed by the appraisers, the buildings and contents having been insured. The repairs were made as soon as possible, and the schools were opened at the usual time. The out-buildings were repaired and painted, the whole being now in good order.

SCHOOL OF PRACTICAL SCIENCE.

Sundry repairs were required to the furnaces of this building, which were made during the vacation. The walls were colored, the ceilings calsomined, and the woodwork oiled and varnished throughout, improvements which were much required, nothing having been done in this respect since the buildings were erected some years since. This building is now in good order, the improvements being of a permanent character.

OSGOODE HALL, TORONTO.

The ceiling of the Library was repaired, painted and tinted, as recommended last year. The usual ordinary repairs to the roofs, drains, etc., were made as required during the year.

The room formerly used as the Heir and Devisee Court-room was converted into a vaulted chamber for the Master of Titles, as directed. The chamber has not been occupied, as some further changes will be necessary to provide a private office, change of stairway, etc.; the arrangements for which have not yet been made, but will be completed next year.

The above work was done by the bricklayer and carpenter employed by the Department.

ALGOMA DISTRICT.

Inspections were made during the month of August of the several Lock-ups, and in company with the Inspector of Prisons for the Western portion of the Province, in this and Thunder Bay Districts. Several improvements were recommended, and having been approved, the improvements were made as required.

At the Lock-ups on Manitoulin Island, namely, Manitowaning, Little Current and Gore Bay, the improvements and repairs were of a trifling description.

At the Gaol and Court-house, Sault Ste. Marie, a new cement floor had to be constructed in the basement of the Gaoler's residence, which was recently constructed, the cement used on the former floor having been injured by the frost. This work was superintended by the Permanent Clerk of Works.

A new log Lock-up was constructed at Killarney, under the superintendence of Mr. H. Munro, Clerk of Works, in charge of the work at Burk's Falls and North Bay, tenders not having been received for the work, though duly advertised for in the usual way. As the unpatented lots at Killarney, a list of which was procured from the Crown Lands Department, were unsuitable for the purpose of this Lock-up, a lot of one-quarter of an acre was purchased on the south side of Commissioners streets. The building has been completed but not yet occupied.

The Gaol and Court-room at Port Arthur and the Lock-up at Fort William, Thunder Bay District, were also inspected. Sundry repairs were required at the former, including 200 feet of one-inch fire hose attached to the force-pump in case of fire, to replace the old hose, which was worn out. Some repairs were made to the offices connected with the Court-room.

At the Lock-up, Fort William, the drain from the basement, connecting with the open ditch along the street, not being low enough, the floor had to be raised eight inches and cemented, the work having been done by the Gaoler. A new fence of barbed wire was also constructed to enclose the lot on Amelia Street.

MUSKOKA DISTRICT.

During the month of July, an inspection was made of the Lock-ups and Registry Offices in this and Parry Sound Districts, in company with the Inspector of Prisons, etc., for the eastern portion of the Province.

Some repairs were required for the Lock-up at Huntsville, which, having been recommended and approved, were made during the year.

The Lock-up at Maganettawan, which was completed early in the year, required some whitewashing and painting. This work was done.

A lot of one acre was selected on the Concession line between lots eight and nine, in the Township of Armour, opposite Mackenzie Street, in the Village of Burk's Falls, for the erection of a Court-room and Lock-up on the same. Tenders were received early in July for the building, which is frame with a stone foundation, similar to that erected at Huntsville. The tender of W. H. Silvester being the lowest was accepted, and the work is now nearly completed, under the superintendence of Mr. H. Munro, Clerk of Works.

Some painting and whitewashing were required for the Lock-up at Bracebridge. This work was done, and the building is now in good condition.

The Registry Office at Bracebridge also required some repairs, which were made.

The Court-room, Lock-up and Registry Office at Parry Sound were also inspected, and some necessary repairs, which were required, having been approved, were made during the year.

NIPISSING DISTRICT.

An appropriation having been made for the construction of a Registry Office at North Bay, a site therefor was secured on the corner of Main and Bye Streets, in the Village of North Bay.

Plans and specifications were prepared, and tenders were received early in July. The tender of Mr. James White, Ottawa, being the lowest was accepted, and the work was completed under the superintendence of Mr. H. Munro, Clerk of Works for the Court-room, etc., Burk's Falls.

A high board fence was constructed round the Lock-up at North Bay, also under Mr. Munro's superintendence.

An inspection was made of the Lock-up at Mattawa, and an alteration in the fence on the north side of the lot was recommended to be made, and was approved. The work was done with the assistance of the prisoners.

UNORGANIZED TERRITORY.

The Inspector of Prisons, etc., having recommended some locks and staples for the cell doors, as additional security to the Lock-up and Court-room at Rat Portage, which having been reported to you and approved, the same were ordered, and the alterations were made. No further expenditure for repairs, etc., were required.

PROVISIONAL COUNTY OF HALIBURTON.

Some further expenditure was required and ordered for repairs to the Registry Office and Court-room at Minden.

The work was done in a satisfactory manner, and the building is now in a good condition.

MISCELLANEOUS.

The fence along the river bank at Niagara Falls was painted early in the spring, and some repairs made to the iron work by Messrs. Cole & McMurray, of Niagara Falls, according to tender. The fence is now in good order.

A tender was received early in July for the erection of a shelter and shed on the grounds at Brock's Monument. The tender of Mr. George Kirkland, Queenston, being the only one, but less than the appropriation, was accepted.

The work was done in a very satisfactory and substantial manner, within the time specified.

Some repairs to the stone work of the monument were also made.

The monument and grounds are now in good order and condition.

I have the honor to remain,

Your obedient servant,

KIVAS TULLY,

Architect, etc.

Hon. C. F. Fraser,
Commissioner of Public Works,
Ontario.

REPORT

OF THE

ENGINEER OF PUBLIC WORKS.

DEAPARTMENT PUBLIC WORKS, ONTARIO,
TORONTO, 31st December, 1886.

HON. C. F. FRASER, *Commissioner of Public Works*:—

SIR,—I have the honour to submit the following report on the works which have been constructed, and repairs and improvements attended to by the Department, also the extension of railways throughout the Province, during the year ending this 31st day of December, A.D. 1886.

GULL AND BURNT RIVER WORKS.

A new slide 50 feet in length and 6 feet in width, with the necessary side piers forming a dam at head of same, has been constructed to facilitate the passage of saw-logs etc., down Bear Creek, and two of the old glance piers taken down and entirely re-built.

The dams at the outlets of Big and Little Bear Lakes, also the dam on the creek at the foot of what is known as the "Big Marsh" have been thoroughly repaired, and supplied with new-stop-logs.

MUSKOKA LAKES WORKS.

In order to facilitate the regulation of the water of Lake Muskoka, one of the outlets at Bala has been further enlarged, by the removal of a quantity of rock from each end of the dam, and the construction of two additional stop-log openings and the necessary shore piers, etc. The new openings formed are 27 and 15 feet in width, each respectively.

The flooring of the openings in the old dam has also been renewed, some windlasses and frames provided, and repairs made to the piers and planking of the stop-log platform.

The dam across the other outlet of the lake has also been supplied with three new stop-logs and one windlass, and repairs made to the flooring of the highway bridge, which is situated immediately below.

The cribwork along the sides of the canal which connects Lakes Joseph and Rosseau at Port Sandfield, having become decayed and in an unsafe condition, was renewed from low water up during the past summer. Tenders for the supply and delivery of the timber required for the work, were asked for by public advertisement in the month of February last, and that of Sylvanus Hough, of Port Carling, being the lowest, was accepted. Operations were commenced in the month of July and continued until the latter part of September,

when the work was completed. The new work will average about 4 feet in height, the length being 350 feet on each side of the cut, with an extension 20 feet in length, running at right angles to it, at the Lake Joseph end.

The swing bridge across the lock at Port Carling, was re-built in the early part of the present year, the old one having become very hard to work and unfit for travel through the decay of the timber of which it was constructed.

MARY'S AND FAIRY LAKES WORKS.

Complaint having been made to the Department that the lands of some of the settlers around Mary's Lake were injuriously affected by water, owing to the height at which it was necessary to keep it maintained in the early part of each season to serve navigation and lumbering interests, provision was made in the estimates of the present year, for making improvements which would lessen or do away with the alleged grievance, and the following have been attended to :—

The outlet of the lake has been enlarged by the removal of an obstruction in the shape of a ledge of rock, which extended from the westerly end of the old dam, to the adjoining precipitous bank, the excavation being 76 feet in length, 12 feet in width and an average depth of 4 feet 6 inches, and the dam has been extended by the construction of three piers and the necessary platform, etc., thus forming two additional stop-log openings, 30 feet in width each, for the escape of flood water.

A new dam has also been constructed across the river at the foot of the shoaly rapid, which extends from immediately below the dam at the outlet of the lake for a considerable distance down stream.

The dam is 360 feet in length, 3 feet 6 inches in height and 14 feet in width, with two piers in same and a stop-log opening 25 feet in width.

This dam is intended to facilitate the passage of saw-logs and timber down the river, by retaining sufficient water on the rapids to float them over, without drawing the quantity from the lake which has heretofore been required to enable this obstruction to be overcome.

By utilizing the water in this manner, it is expected that the settlers will be benefited, as the lake can be allowed to lower beyond the level at which it has been necessary to maintain it in former years, and the lumbermen, owing to the comparatively small quantity of water required to serve their purpose, will also be enabled to run their timber later on in the season, and thus, in a great measure avoid the loss and inconvenience which they have frequently had to endure, owing to the water supply being insufficient to serve both their's and the interest of navigation.

Three piers have been constructed in the river above the dam, to afford support to glance booms, which are required to guide the logs into the slide opening.

Provisions was also made in the estimates under this head for the removal by dredging of a shoal, situated in the river immediately below the lock, which interferes with navigation during low water, but as the Department will have scows on these waters next season, it was decided to allow the work to stand until then, when the excavated material can be more satisfactorily disposed of.

A re-vote of the unexpended balance of the appropriation, will therefore require to be taken to enable it to be attended to during 1887.

PENINSULA CREEK IMPROVEMENT.

An appropriation of $8,000.00 was granted last session for service on this work during the present year.

As explained in a previous report, the improvement will consist of the formation of a navigable channel for steamboats along the ravine traversed by the creek, which forms the outlet of Peninsula, connecting it with Fairy Lake.

The distance between the lakes along the line of the proposed channel is about 4,612 feet, but the length of the excavation will exceed this considerable, owing to the existence of a shoal at the outlet of Peninsula Lake.

In the formation of the channel, the present creek will be utilized as much as possible, but owing to its tortuous course this can only be done to a limited extent.

Operations were commenced in the latter part of July, the work consisting of clearing the land of trees and stumps, and the removal of stones, boulders, sunken logs and other debris from along the line of the proposed excavation. A coffer-dam was also constructed across the outlet of Peninsula Lake, which enabled considerable material to be removed with teams and scrapers.

While these works were being proceeded with, a dredge-scow was put under construction, and upon its completion fitted up with machinery, which had in the meantime been removed from the scow on Lake Nipissing and brought to the locality.

Dredging was commenced on the 5th of October, and continued until the latter part of December, when a channel of about 20 feet in width and 4 feet 6 inches in depth at low water, had been excavated for fully two-thirds the distance between the lakes.

A highway bridge, which interfered with the passage of the dredge, was removed and a temporary one erected for the accommodation of the public, but provision will require to be made for the erection, during the coming year, of a new structure, which will admit of the steamers passing under it.

It is intended to resume operations in the early part of 1887, and continue to push the work as rapidly as possible until completion.

MOIRA RIVER IMPROVEMENT.

An appropriation of $5,000.00 was granted last session for service on the improvement of this stream. Operations were commenced in the latter part of August, near the village of Foxboro, where a ledge of rock originally extended across the river, forming a barrier which seriously interfered with the escape of floodwater during freshets or after protracted or heavy rainfall.

After the erection of the necessary coffer-dam blasting operations were commenced and continued until the width of the existing channel was increased from 30 to 60 feet, the average depth of cutting being about 2 feet, and the length about 760 feet.

The old channel was also improved by the removal of rock, which extended in several places above the general level of the bottom, forming obstructions which interfered to a considerable extent with the usefulness of the work. A quantity of loose stones and boulders were removed below the cutting, until a clear channel of about 60 feet in width had been formed.

At Corbyville, situated some distance further down the stream, a pier 192 feet in length, varying in height from 2 to 5 feet, and averaging 7 feet in width, was constructed, and a channel excavated through the rock about 270 feet in length, 5 feet in width and an average depth of 20 inches.

LAKE NIPISSING DREDGING.

Provision was made in the estimates for the present year for the further improvement of the steamboat channel at the mouth of South River, it having been found that the work previously done at this point, was not sufficient to prevent navigation being interfered with during seasons of extreme low water.

Dredging was commenced about the 20th of May, and continued until the channel had been improved for a length of about 1,300 feet, and a width of 55 feet, when the work provided for having been completed, operations were, in the latter part of August, brought to a close.

BALSAM RIVER WORKS.

The swing-bridge forming a portion of the structure which crosses the Balsam River, connecting the highways at the village of Rosedale, has been re-constructed.

In order to avoid causing inconvenience to the public, the work was commenced in the early part of the season, which enabled the ice to be utilized as a temporary crossing,

until the new structure was sufficiently advanced to allow traffic to be resumed in the usual way.

Later on in the season, a new abutment was built at the northerly end of the bridge, the guide piers repaired, and the platform on same supplied with some new stringers and planking.

At the dam adjoining the lock some gravelling was done, and temporary repairs made to the piers at the slide opening in same, but as these are in a dilapidated and worn-out condition, provision should be made for re-building them, in the early part of the coming year.

SCUGOG RIVER WORKS.

A re-vote of the unexpended balance of the appropriation for the reconstruction of the Lock at Lindsay was taken last session.

At the close of 1885 considerable progress had been made, and operations being continued during the winter, the work was completed in the early part of the present year, navigation having in no way been interfered with.

The channel excavated some years ago by the Department, from Scugog River to Drummond's Bay, having filled in to a certain extent in places, and become otherwise obstructed, so that navigation was interfered with, has been improved by dredging during the present year.

Operations were commenced in the month of May and continued until the latter part of June, when the cut had been made a sufficient depth and extended some distance into Drummond's Bay. The quantity of material excavated was about 6,500 cubic yards, in addition to which a number of obstructions formed of sunken roots and flood-wood were also removed.

The steamboat channel in Lake Scugog has also been improved by the removal of about 2,000 cubic yards of sand, which formed an obstruction about two miles above the outlet, and the river bed has been cleared of obstructions in the shape of sunken logs, stones, and other debris which interfered with navigation between the lock and the old railway bridge, the dredge being employed for ten days on the last mentioned work.

MAGANETEWAN WORKS.

The construction of the portion of these works under contract, consisting of a lock, channels, and wing-dams, was commenced during the month of December, 1883, and at the close of 1885 the work was well advanced.

Operations were continued throughout the winter, and until the latter part of April of the present year, when, owing to the heavy spring freshet, the work had to be suspended for a time.

Operations were resumed in the early part of June and continued until the completion of the improvement in the early part of July, the first lockage of the steamboat being made on the 8th of that month.

The lift of the lock from the lower to the upper water level will usually be about 10 feet 6 inches, but of course this will vary slightly, depending, as it does, entirely upon the manner in which the water of the lakes above and below are regulated and controlled by the dams which have been erected at their outlets.

The lock chamber is 28 feet in width and 112 feet in length, from point to point, of mitre-sills, and the lower mitre-sill has been kept down sufficiently to allow a depth of 5 feet 6 inches of water to be maintained upon it during the seasons of low water.

The bottom of the lock chamber being entirely of rock, only small portions of it adjoining the mitre-sills, was floored. The lock walls, 168 feet in length from end to end, are constructed of timber cribwork, filled and backed up with stone; they are 12 feet in width, with the exception of a portion at the lower end on the easterly side, where, owing to the height, the width was increased to 18 feet for a length of about 50 feet, in order to give greater stability to the structure.

The wing-dams are also constructed of cribwork, filled with stone, the bottom timbers being scribed and bolted to the rock. The dams have a total length of 434 feet, the width being 12 feet, and the height varying, the average being about 6 feet. The dam on the westerly side of the lock is 302 feet, and that on the easterly side 132 feet in length, in the latter of which provision is made for the escape of flood water through two stop-log openings 20 and 24 feet in width respectively, the dam being supplied with platform windlasses, etc., so as to enable the stop-logs to be taken out and replaced as desired.

The entrance channels above and below the lock are about 40 feet in width, in the formation of which the work consisted entirely of rock excavation.

Since a short time after the completion of the lock, the Muskoka and Nippising Navigation Company's steamer, Wenonah, has made a daily trip between Burk's Falls and Ah-Mic Harbour. This has proved a great convenience to the public in general, but more especially to residents of the locality, affording, as it does, an easy means of transit from point to point, and greatly lessening the inconvenience formerly experienced by the settlers in getting in their supplies.

The Navigation Co. also have a small steamer called the Se-se-be navigating these waters, which during the past season has been kept plying principally between Burk's Falls and Maganetewan, leaving the former after the arrival of the train going northward, and returning again in time to make connection with it going south the following morning, thus enabling passengers to make the journey from Toronto or Hamilton and intermediate points to Maganetewan in a single day, and *vice versa*. The accommodation afforded also greatly facilitates the journey across the country from the Pacific Railway to Parry Sound, and places in that vicinity.

In addition to the work under contract the following improvements have been made on these waters during the present year under the direct management of the Department :

The improvement of the river immediately below Burk's Falls was again proceeded with, operations being commenced in the latter part of the month of May. The work consisted principally of the further removal of stones and boulders which formed a series of shoals, obstructing the channel for a distance of about half a mile down stream. The prosecution of the work was greatly facilitated by using the Departmental diving apparatus ; many of the boulders being of such a size as to render blasting necessary in order to enable them to be removed. A considerable quantity of dredging by horse-power had also to be done in order to remove a shoal of gravel bound together with tenacious clay, which extended almost entirely across the stream, forming an obstruction which could not well be removed otherwise. Operations were continued until the month of August, when a channel about 40 feet in width, and having a depth of about 5 feet at low water, had been provided.

Upon the completion of the work at Burk's Falls, the southerly outlet of Se-se-be Lake was further enlarged, in order to provide for the escape of flood-water in time of freshets ; the original northerly outlet being now obstructed by the lock works. The work consisted of the removal of stones and boulders from the channel, a short distance above the falls, and also the removal by blasting of a rocky obstruction which interfered with the passage of water at this point. The channel immediately above the falls was also further improved by the removal of a considerable quantity of solid rock ; also earth gravel and boulders, and a dam constructed across to enable the water of the lake to be regulated as may be necessary in order to best serve the different affected interests. The dam is about 130 feet in length, 15 feet in width and will average 8 feet in height, with three stop-log openings in same 30 feet in width each. It is supplied with the necessary stop-log platform windlasses and chains.

A storehouse 12x18 ft., constructed of one inch vertical boarding, battened, with shingled roof, has been erected adjoining the lock, it being required as a place of safe-keeping for tools, etc., belonging to the Department, and also as a shelter for the lock-master during inclement weather. A cribwork pier, which was constructed by the contractor below the lock, and which answered for a cofferdam during construction, was allowed to remain in position after the completion of the work, and upon this a pier 110 feet in length, 6 feet in width and 4 feet in height, has been constructed in order to keep the steamboat channel free from floating obstructions during high water, and to facilitate the entrance to

the lock. A double boom, 150 feet in length, and strongly bolted together, has also been constructed and placed along the channel to prevent the steamer from being injured by striking on projecting points of rock, which without some protection of this description it would be impossible to avoid doing, when the wind is blowing from certain directions. Booms constructed of flatted timber have also been provided, and placed in the channels, both above and below the lock, to serve as a temporary protection to the steamer from accident, but further improvements of this description, and of a more substantial character, are required, for which it is very desirable provision should be made in the estimates for the coming year.

NATION RIVER WORKS.

As stated in my report for 1885, the improvement of this stream above Chesterville was commenced during the summer of that year, the work being carried on by the municipal council of the united counties of Stormont, Dundas and Glengarry, the funds required for its prosecution being provided by by-law, supplemented by an appropriation from the Dominion Government and the Provincial grant of $7,000.

A re-vote of the unexpended balance of $5,000 was taken last session.

Operations were resumed on the 24th of May last and continued until the 7th of December, the dredge being kept at work both day and night for about four months previous to the time when work was suspended.

The total excavation to date is 60,563 cubic yards, 32,612 of which have been removed during the present year.

An examination was made on the 1st October by a Departmental engineer, and it being ascertained that the excavation to that date was somewhat in excess of 42,000 cubic yards, a further payment of $2,000 was made out of the appropriation on account of work done. This has been the only expenditure during the present year, consequently a re-vote will require to be again taken for service during 1887; when it is expected the portion of the improvement at present under contract will be completed.

MAINTENANCE LOCKS, DAMS, AND SWING BRIDGES.

The following repairs and improvements have been made out of this appropriation during the present year :—

Elliott's Falls—Dam and Slide.

The wing-dam on the westerly shore of the river, situated between the stop-log dam and the lower slide, has been reconstructed for a length of 70 feet, and the guide piers at the upper end of the slide raised two feet in height and filled with stone. A new glance boom 60 feet in length has also been provided, and the dam supplied with four new stop-logs.

Oblong Lake Dam.

Repairs were necessary to this dam owing to damage sustained during the spring freshet. These have been attended to and the dam gravelled and supplied with several new stop-logs.

Hall's Lake Dam.

This dam has been supplied with two new stop-logs, and the old ones have been refitted.

Eagle Lake Dam.

This dam has been gravelled and supplied with some new stop-logs.

The dam at the outlet of Ah-Mic Lake has been supplied with some new stop-logs, and slight repairs made to the dams at the outlets of Hawk, Crab, Paint, Kenesis, and Redstone Lakes.

Port Carling Lock.

During the season of navigation of 1885, considerable inconvenience was experienced in working this lock, owing to settlement of the gates from their proper positions.

The necessary repairs were made during the following winter, the gates being taken out of the lock, dressed-off, and strengthened with additional bolts and diagonal braces of 3½in, by ⅝in. wrought iron.

Mary's and Fairy Lakes Lock, etc.

Repairs have been made to the upper gates of this lock, and the dam supplied with several new stop-logs.

A portion of the floor planking of the bridge, in the village of Huntsville, has also been renewed.

Young's Point Lock.

The guide piers at the head of the canal above this lock, were damaged by the spring freshet and a portion of the boom carried over the dam. The boom was recovered and again placed in position, but considerable repairs require to be made to the piers in the early part of the coming year.

Repairs have been made to the three swing-bridges at Lindsay, and also to the planking of the dam, and a building 12 x 30 ft. has been erected on the lock grounds, to be used as a place of storage for plant of various kinds belonging to the Department.

The following are the lockmaster's returns of the lockages made at the different locks during the present year:—

Young's Point Lock—752 steamboats, 132 scows, and 172 cribs of timber, etc.

Balsam River Lock—66 steamboats, 46 scows, 19 small boats, 30 cribs of timber, 175,000 saw-logs and 2,175 pieces of boom timber.

Lindsay Lock—149 steamboats, 135 scows and 106 cribs of timber.

Mary's and Fairy Lakes Lock—266 steamboats, 9 scows and 6 cribs of timber.

Port Carling Lock—1497 steamboats, 364 small boats, 101 scows and 168 cribs of timber.

Maganetewan Lock—213 steamboats, 4 small boats, 4 scows and 12 cribs of timber.

LANDING PIER AT SOUTHAMPTON.

An appropriation of $700.00, was granted last session to aid in re-constructing the public landing pier at this village.

Upon the Department being notified that the work was completed, an examination was made, when it was ascertained that the cost of the improvement had been less than was originally anticipated and that the cost to the Province would be only $300. A cheque for this amount was therefore sent to the Treasurer of the village of Southampton, as payment of the proporation undertaken to be borne by the Province.

DAM AT KINMOUNT.

A re-vote of the appropriation granted in 1884, to meet one-half the cost of re-constructing the dam across the Burnt River at Kinmount, such one-half not to exceed the sum of $2,750.00, was taken last session.

The work has been proceeded with during the present year, is now well advanced, and will be completed in the early part of 1887. A re-vote will be required to be taken in respect to this work.

EXTENSION OF RAILWAYS IN 1886.

The details of work done on the different lines of railway under construction during the present year, are, as far as could be ascertained, as follows :—

Erie and Huron Railway.

The extension of this railway from Wallaceburg to Sarnia, a distance of 30½ miles, was commenced during 1885, and at the close of that year the work was well advanced. Operations were continued until the 6th of September last, when the line was completed and opened for traffic.

Northern and Pacific Junction Railway.

The construction of this railway from the terminns of the Northern and North-Western at Gravenhurst, to La Vase on the C.P.R., was commenced about the 1st September, 1884, and at the close of 1885, the work was sufficiently advanced to admit of construction trains being run over the greater part of the line.

The portion extending from Gravenhurst to Sundridge a distance of 71¼ miles, was completed and opened for traffic on the 25th of June last, and on the 6th of September the remaining distance to La Vase was opened, trains being run north from Sundridge twice a week ; this was continued until the 20th of November, when a daily train from Toronto was put on and North Bay, on the C.P.R., made the terminal station.

Ontario and Quebec Railway.

An extension of this railway has been proceeded with during the present year from Smith's Falls to Montreal, a distance of about 128 miles, 82¼ of which are in the Province of Ontario.

Construction work was commenced in the latter part of May and has since been vigorously prosecuted, the grading being now completed for a length of 124 miles and the track-laying and ballasting also well advanced.

It is expected that this portion, extending from Smith's Falls to the junction of the line near Lachine, with the Atlantic and North-West Railway, will be completed and opened for traffic in the spring of the coming year.

West Ontario Pacific Railway.

The construction of this railway has been commenced during the present year, the terminal points being Woodstock and the Detroit River.

Construction was commenced between Woodstock and London, about the 1st of September last, and I understand that the grading between these points, a distance of 26⅝ miles, is now about completed, and that track-laying and ballasting has been commenced.

It is expected that this portion of the line will be completed and opened for traffic, during the coming spring, and it is intended to push the work from London westward to completion.

Nosbonsing and Nipissing Railway.

This company was only incorporated at the last session of the Legislature, but the railway has been in operation for some years.

Construction was commenced in December 1883, and continued until October of the following year, when the line extending from the mouth of the Wisawasa River on South-East Bay, Lake Nipissing to Lake Nosbonsing, a distance of about five miles, was completed.

The railway is not open for passenger traffic, but is used principally for transporting saw-logs from the water of Lake Nipissing to Lake Nosbonsing, from where they are floated to various points on the Ottawa River.

Irondale, Bancroft and Ottawa Railway.

The construction of this railway (formerly the Toronto and Nipissing Eastern Extension), was commenced in the month of October last. The line extends from a point on the Victoria Railway, about two miles northerly from the Village of Kinmount, in an easterly direction, touching Furnace Falls, Irondale, Pine Lake, and continuing to Bancroft, in the Township of Faraday, County of Hastings, the length being about 50 miles.

I understand the work is now sufficiently advanced, to admit of construction trains being run to Irondale, a distance of about 10 miles, and it is expected that the remaining portion will be completed, and the line opened for traffic to Bancroft during the coming year.

Brockville, Westport and Sault Ste. Marie Railway.

This railway is intended to extend from Brockville to Sault Ste. Marie, a distance of about 500 miles.

The construction of the line was commenced in the month of July last, and I understand that the grading for a length of about 40 miles, between Brockville and Westport is now completed, and that track-laying will be proceeded with as early as possible in the coming spring.

It is expected that the portion of the line, extending from Brockville to Westport, a distance of about 46 miles, will be completed and opened for traffic about the 1st of June next.

The following revised statement to the close of 1886, gives in detail the mileage on each railway in Ontario, distinguishing between those constructed prior to, and after Confederation :—

REVISED STATEMENT.

No.	Name of Railway.	Terminal Points. From.	Terminal Points. To.	Completed prior to Confederation. Length in Miles.	Completed since Confederation. Length in Miles.	At Present under Construction or Contract. Length in Miles.
1	Grand Trunk Railway, Main Line	Eastern Province Boundary.	Point Edward	457		
2	do Buffalo & Lake Huron Branch	Fort Erie	Goderich	158		
3	do London Branch	St. Marys	London	23		
4	do Galt & Doon Branch	Galt	Berlin	7	4.5	
5	do Toronto & Nipissing Branch	Toronto	Coboconk		88	
6	do Midland Railway, Main Line	Port Hope	Midland City	65	54.53	
7	do do Peterboro' Branch	Millbrook	Lakefield	13	9	
8	do Lake Simcoe Junction	Stouffville	Jackson's Point		26.5	
9	do Whitby, Port Perry & Lindsay	Whitby	Lindsay		46.	
10	do Victoria Railway	Lindsay	Haliburton		55.81	
11	do Grand Junction Railway	Belleville	Peterborough		64.65	
12	do Belleville & North Hastings	Grand Junction Railway	Madoc		22.	
13	do Toronto & Ottawa, Main Line	Peterborough	Casselman		9	173
14	do do Manilla Link	Wick	Manilla		6.5	
15	do do Omemee Link	Omemee	Peterborough		14.	
16	do Port Dover & Lake Huron	Port Dover	Stratford		63	
17	do Stratford & Huron	Stratford	Wiarton		106.27	
18	do Georgian Bay & Wellington	Palmerston	Durham		26.	
19	Grand Trunk Railway, Great Western Div. Main Line	Suspension Bridge	Windsor	229		
20	do Toronto & Hamilton Branch	Toronto	Hamilton	39.5		
21	do Loop Line Division	Glencoe	Fort Erie		145	
22	do Sarnia Branch	Komoka	Sarnia	51		
23	do Petrolia Branch	Wyoming	Petrolia	7		
24	do Brantford Branch	Harrisburgh	Brantford	8		
25	do Brantford & Norfolk	Brantford	Tilsonburgh		35.88	
26	do Wellington, Grey & Bruce	Harrisburgh	Southampton	27	102.	
27	do do S. Extension.	Palmerston	Kincardine		66.	
28	do London, Huron & Bruce	Hyde Park Junction	Wingham		69.75	
29	do London & Port Stanley	London	Port Stanley	25		
30	do Welland Railway	Port Colborne	Port Dalhousie	25		
31	Canadian Pacific Railway, Main Line	Ottawa	Western Province Boundary	57	1144.	
32	do Algoma Branch	Sudbury Junction	Sault Ste. Marie		94.75	86
33	do Brockville & Ottawa Railway	Brockville	Carleton Place	46		

34	Canadian Pacific Railway, St. Lawrence & Ottawa Ry. and Chaudiere Branch	Prescott	Ottawa	59.5		
35	do Ontario & Quebec Railway	Toronto Junction	Eastern Province Boundary.	12.	281.25	
36	do Credit Valley Ry., Main Line	Toronto	St. Thomas		119.13	
37	do do Orangeville Branch	Streetsville	Elora and Orangeville		62 83	
38	do Toronto, Grey & Bruce, Main Line	Toronto	Owen Sound		122.	
39	do do Teeswater Br.	Orangeville	Teeswater		73.	
40	do West Ontario Pacific Railway	Woodstock	Detroit River			136
41	do Pr. Arthurs Landing & Kaministiqua.	Prince Arthur's Landing	Fort William		6	
42	Northern Railway, Collingwood Line	Toronto	Meaford	94	21	
43	do Muskoka Branch	Barrie	Gravenhurst		53	
44	do Hamilton & Northwestern, Main Line	Port Dover	Allandale		135.3	
45	do do Collingwood Br.	Clarksville	Collingwood		40.	
46	do North Simcoe Junction	Colwell	Penetanguishene		33.34	
47	Northern & Pacific Junction Railway	Gravenhurst	La Vause		111.5	
48	Canada Southern Railway, Main Line	Fort Erie	Amherstburgh		229.	
49	do St. Clair Branch	St. Thomas	Courtwright		62	
50	do Essex Cut-off	Essex Centre	Sandwich		15.5	
51	do Niagara Branch	Niagara	Fort Erie	30		
52	Canada Atlantic Railway	Ottawa	Eastern Province Boundary		68.08	
53	Cobourg, Peterborough & Marmora Ry., Marmora Line.	Cobourg	Harwood	22		
54	do do Peterborough Line.	Rice Lake	Chemong Lake		9	13
55	Kingston & Pembroke Railway	Kingston	Renfrew		103.	
56	Prince Edward County	Picton	Trenton at G. T. R.		32.44	
57	Central Ontario Railway	Trenton at G.T.R.	Coe Hill		74.	
58	Erie & Huron Railway	Rondeau	Sarnia		70.47	
59	Napanee, Tamworth & Quebec Railway	Napanee	Tamworth		30.	
60	Bay of Quinté Railway	Deseronto	Grand Trunk Railway		3.5	
61	Nosbonsing & Nipissing Railway	Lake Nipissing (S. E. Bay).	Lake Nosbonsing		5.	
62	Ontario & Sault Ste. Marie Railway	Sault Ste. Marie	Spanish River			125
63	Irondale, Bancroft & Ottawa Railway	Kinmount	Bancroft			50
64	Brockville, Westport & Sault Ste. Marie	Brockville	Sault Ste. Marie			500
				1455	4013.48	1083

When compiling the foregoing statement I was unable to obtain definite information regarding the exact point at which the westerly boundary line of the Province crosses the C. P. R., but as all available information seemed to indicate the point to be at or near Ingolf, the length given as main line extends from Ottawa to the above named station.

I have the honour to remain, Sir,
Your obedient servant,

ROBT. McCALLUM,
Engineer Public Works.

STATEMENTS

OF

THE ACCOUNTANT

AND

LAW CLERK.

No. 1.—Expenditure for Fuel, Gas, and Water, and for Repairs and Furniture and Furnishings etc., during 1886 (from Maintenance Accounts).

NAME OF SERVICE.	Fuel, Gas and Water.	Repairs to Buildings and Works, Furnishings, etc.	Totals.
	$ cts.	$ cts.	$ cts.
Government House	2,334 11	3,744 19	6,078 30
Parliament Buildings, Main Building	2,918 56	6,402 26	9,320 82
" " West Wing (C. L. Dep't	938 68	943 53	1,882 21
" " East Wing	1,022 58	1,458 29	2,480 87
Rented Premises, Simcoe Street, (Attorney-General's and Public Works Departments)	494 50	1,787 14	2,281 64
Education Department and Normal and Model Schools, Toronto	2,362 64	3,759 03	6,121 67
Normal and Model Schools, Ottawa	1,888 89	546 29	2,435 18
Agricultural College, Guelph	4,224 30	1,695 37	5,919 67
School of Practical Science, Toronto	1,044 25	719 49	1,763 74
Osgoode Hall, Toronto	3,374 44	3,742 78	7,117 22
Agricultural Hall, Toronto	137 36	4 09	141 45
Maintenance of Locks, Dams, Slides, etc.	.....	2,635 09	2,635 09
Lockmasters, Bridge-tenders, etc. (Salaries)	.....	2,270 34	2,270 34
Superintendent of Locks, Dams, etc (Salary)	.....	1,200 00	1,200 00
General Clerk of Works and Repairs, for Public Institutions (Salary)	.....	1,200 00	1,200 00
Carpenter, engaged on Government Buildings generally (Salary)	.....	720 00	720 00
Totals	20,740 31	32,827 89	53,568 20

J. P. EDWARDS,
Accountant.

Department of Public Works, Ontario,
Toronto, *January*, 1887.

No. 2.—Statement of the Expenditure on Public Buildings and Works in 1886, and Total Expenditures up to the 31st December, 1887.—(Capital Account.)

NAME OF WORK.	Expenditures from 1st July, 1876, to 31st Dec., 1884.	Expenditure, 1885.	Expenditure, 1886.	Totals.
	$ c.	$ c.	$ c.	$ c.
Government House	158,997 00	1,111 92	1,276 63	161,385 55
Parliament and Departmental Buildings	84,545 30	740 68	.....	85,285 98
New Parliament Buildings	7,876 76	26 90	8,119 44	16,023 10
Asylum for the Insane, Toronto	257,410 53	3,987 46	6,141 90	267,539 89
" " London	637,732 24	6,089 12	5,233 03	649,054 39
" " Hamilton	386,827 28	29,255 04	53,662 28	469,744 60
" " Kingston	234,903 73	44,512 49	14,617 76	294,033 98
" (Branch) " "	.....	.....	9,299 94	9,299 94
Asylum for Idiots, Orillia	52,051 68	13,629 42	65,033 21	130,714 31
Deaf and Dumb Institute, Belleville	207,616 72	4,834 99	5,659 69	218,111 40
Blind Institute, Brantford	217,932 59	924 13	3,578 31	222,435 03
Reformatory for Boys, Penetanguishene	113,638 04	759 69	5,871 53	120,269 26
Central Prison, Toronto	586,542 86	7,373 33	8,940 93	602,857 12
Agricultural College, Guelph	269,198 52	3,868 92	22,462 99	295,530 43
School of Practical Science, Toronto (old building)	59,100 26	.....	.....	59,100 26
" " " (new building)	51,364 66	286 81	497 10	52,148 57
Andrew Mercer Reformatory for Females, Toronto	107,708 94	.....	.....	107,708 94
" " " "	35,691 13	3,840 74	1,963 73	41,495 60
Normal and Model Schools, Toronto	71,082 58	1,393 71	1,909 61	74,385 90
" " Ottawa	144,143 78	1,106 47	1,416 84	146,667 09
Government Farm, Mimico	51,646 34	.....	.....	51,646 34
Osgoode Hall, Toronto	90,626 93	14,172 61	3,476 78	108,276 32
Brock's Monument, Queenston Heights	2,122 25	126 84	797 72	3,046 81
Niagara River Fence	7,607 18	100 95	317 35	8,025 48
Muskoka District—Immigration Sheds at Gravenhurst	355 00	.....	.....	355 00
" Registry Office and Lock-up, Bracebridge	6,588 01	.....	87 69	6,675 70
" Lock-up and Court Room at Huntsville	6,889 51	42 25	193 03	7,124 79
Algoma District—Court House and Registry Office, Sault Ste. Marie	7,958 24	.....	168 04	8,126 28
" Residence for Gaoler do	.....	1,425 04	470 90	1,895 94
" Three Lock-ups, Grand Manitoulin Island	8,189 61	.....	56 55	8,246 16
" Lock-up, at Killarney	.....	.....	679 99	679 99
Thunder Bay District—Registry Office and Lock-up, Port Arthur	19,673 33	.....	382 13	20,055 46
" " Addition to Gaol and Court House, Port Arthur	60 15	10,673 06	4,561 58	15,294 79

No. 2.—Statement of the Expenditure on Public Buildings and Works in 1886—(Capital Account).—*Continued.*

NAME OF WORK.—*Continued.*	Expenditures from 1st July, 1867, to 31st Dec., 1884.	Expenditure, 1885.	Expenditure, 1886.	Totals.
	$ c.	$ c.	$ c.	$ c.
Thunder Bay District—Lock-up at Fort William	44 83	3,572 32	1,050 18	4,667 33
" " Lock-up at Silver Islet, Lake Superior	2,304 79	.....	.....	2,304 79
Parry Sound District—Registry Office, Lock-up, etc., Parry Sound	7,801 44	145 75	274 51	8,221 70
" " Lock-up at Maganetawan	.....	360 00	223 92	583 92
" " Lock-up and Court Room at Burk's Falls	.....	.....	3,153 21	3,153 21
Nipissing District—Lock-up at Mattawa	2,716 65	54 49	262 25	3,033 39
" Lock-up at North Bay	.....	917 00	947 80	1,864 80
" Registry Office at North Bay	.....	.....	2,789 95	2,789 95
Unorganized Territory—Lock-up and Court Room at Rat Portage	15,256 86	98 00	27 25	16,382 11
Provisional County of Haliburton—Registry office at Minden	2,987 50	544 85	217 27	3,749 62
Lock and Bridges at Port Carling, Muskoka	39,993 02	.....	.....	39,993 02
Lock at Young's Point	30,892 72	.....	.....	30,892 72
Lock at Balsam and Cameron Lakes	23,959 02	.....	.....	23,959 02
Lock and Works, Mary's and Fairy Lakes	41,974 48	.....	3,460 73	45,435 21
Maganetawan Works—Lock, Dam and River	5,735 27	14,247 27	16,805 51	36,788 05
Cut and Bridge, Port Sandfield	14,146 09	.....	.....	14,146 09
Georgian Bay Works	.....	984 36	.....	984 36
Landing Pier at Port Elgin	1,000 00	.....	.....	1,000 00
" Southampton	.....	.....	300 00	300 00
Muskoss Falls Works	6,094 57	.....	.....	6,094 57
Muskoka Lakes Works	4,373 49	.....	3,589 91	7,963 40
Nipissing Lake Works	7,341 43	.....	1,840 74	9,182 17
Couchiching Lake Works	427 84	.....	.....	427 84
Mud Lake Works	.....	1,502 32	.....	1,502 32
Peninsula Creek Improvement	.....	.....	6,413 64	6,413 64
Stony Creek Works	828 25	.....	.....	828 25
Gull and Burnt Rivers Works	64,511 51	598 94	1,668 88	66,779 33
Muskoka River Works	38,198 93	.....	.....	38,198 93
Sydenham "	2,156 26	.....	.....	2,156 26
Nottawasaga "	5,915 09	.....	.....	5,915 09
Kaministiquia "	22,865 02	.....	.....	22,865 02
Scugog " (including Lindsay Lock and Swing Bridges)	68,975 39	6,200 85	4,285 94	79,462 18
Pigeon "	4,999 62	.....	.....	4,999 62

Otonabee River Works	4,962 42			4,962 42
Balsam "	4,080 95		1,452 91	5,533 86
Wye "	5,176 98			5,176 98
Nation "	3,248 50	2,628 73	2,000 00	7,877 23
Moira River Improvement			2,135 22	2,135 22
Trent River Bridge	2,000 00			2,000 00
Washago and Gravenhurst Road	32,792 12			32,792 12
Washago Wharf	489 22			489 22
Portage du Fort Bridge	5,247 99			5,247 99
Des Joachim's Rapids, Bridge and Approaches	5,200 75	736 97		5,937 72
Surveys, Inspections, Arbitrations and Awards	35,567 93	2,709 95	1,704 16	39,982 04
Roads in Township of Ryerson	7,295 06			7,295 06
Clearings and Log-houses on Free Grant Lands, Settlers' Homestead Fund	16,780 75			16,780 75
Aldborough Drainage Works	7,199 02			7,199 02
Brooke " "	34,747 73			34,747 73
Delaware " "	5,740 93			5,740 93
Dunwich " "	10,105 86			10,105 86
Ekfrid, Caradoc, and Metcalfe Drainage Works	13,667 66			13,667 66
Grey Drainage Works	8,175 47			8,175 47
Moore " "	17,091 58			17,091 58
Mosa " "	12,714 75			12,714 75
Nissouri, West, Drainage Works	8,178 50			8,178 50
Raleigh " "	36,409 64			36,409 64
Russell " "	11,543 77			11,543 77
Sarnia " "	40,540 55			40,540 55
Sombra " "	53,169 04			53,169 04
Tilbury, East " "	35,297 62			35,297 62
Tilbury, West " "	31,577 06			31,577 06
Williams, East	2,221 75			2,221 75
Surveys, and Drainage of Swamp Lands, Provincial Account	36,448 51			36,448 51
Totals	4,790,253 33	185,584 37	281,480 66	5,257,318 36

DEPARTMENT OF PUBLIC WORKS, ONTARIO,
TORONTO, *January*, 1887.

J. P. EDWARDS,
Accountant.

No. 3.—Contracts and Bonds entered into with Her Majesty in 1886.

Date.	Work.	Subject of Contract.	Contractors.	Sureties.	Amount.	——
1886.					$ c.	
Feb. 28...	Maganetawan Works —Dam at outlet Se-se-be Lake.	Timber for	Wm. McLachlan, of the Village of Maganetawan.	John Fluker, of the Village of Maganetawan, and Alex. H. McLachlan, of the same place.	14	per lineal foot, pine timber, 16 to 41 feet long.
					12	per lineal foot, pine timber, 15 feet and under.
					22	per lineal foot, oak timber.
					10 00	per M., B.M., pine plank.
					20 00	per M., B.M., maple plank.
March 1..	Muskoka Lakes Works — Reconstruction of cribbing at Port Sandfield.	Timber for	Silvanus Hough, of the Village of Port Carling.	John F. Pain, of the Township of Medora, and John Fraser, of the Village of Port Carling.	12	per lineal foot, white pine timber, 12×12 in. square.
					10	per lineal foot, white pine timber, 10×12 in. square.
					10	per lineal foot, white pine timber, 10×12 in. flatted.
March 9..	Mary's and Fairy Lakes Works—Dam at Port Sydney.	Timber for	William Chalmers, Jr., of the Village of Port Sydney.	Wm. Chalmers, Sr., of the Village of Port Sydney, and Theo. A. Taylor, of the Village of Bracebridge.	13	per lineal foot, white pine timber, 12×12 in. square.
					12	per lineal foot, white pine timber, 10×12 in. square.
					16	per lineal foot, white pine timber, 9×12 in. square.
May 8 ...	Asylum for the Insane, Hamilton.	Construction of (South) cottage and of steam-heating apparatus for same.	John Dickenson, of the Village of North Glanford, and Edward Dickenson, Jr., of the same place.	Edward Dickenson, Sr., of the Village of North Glanford, and Henry Dickenson, of the Town of Woodstock.	122,000 00	
May 8 ..	Asylum for Idiots, Orillia.	Construction of a building for gas works and for a pumping house.	John Damp, of the City of Toronto.	John Davis, of the Village of Davisville, and Joseph McCausland, of the City of Toronto.	5,438 00	
May 10...	Asylum for Idiots, Orillia.	Steam heating apparatus, gas works and water supply.	Messrs. Keith & Fitzsimons, of the City of Toronto.	David S. Keith, of the City of Toronto, and Alexander Gemmell, of the same place.	18,635 00	
June 4....	Agricultural College, Guelph.	Construction of new farm buildings.	Frederick William Schwendimann, of the Village of Drayton.	William H. Whealey, of the Village of Drayton, Robert McMilliam, M.D., of the same place, and Louis A. Noecker, of the same place.	15,980 00	

July 7...	Peninsula Creek Improvements.	Timber for	Messrs. McConachie and Calder, of the Village of Huntsville.	Floyd W. Clearwater, of the Village of Huntsville, and J. F. Reece, of the same place.	16 50	per M., B. M., white pine timber.
					35 00	per M., B. M., white oak timber.
July 20...	Parry Sound District, Court Room and Lock-up at Burk's Falls.	Whole work..	Walter H. Silvester, of the Village of Burk's Falls.	James Sharpe, of the Village of Burk's Falls, and William Wilson, of the same place.	2,950 00	
July 20...	Deaf and Dumb Institute, Belleville.	New water supply, pipes and hydrants.	Messrs Keith & Fitzsimons, of the City of Toronto.	Alex. Gemmell, of the City of Toronto, and John S. Brown, of the same place.	2,550 00	
July 20...	Asylum for the Insane, Hamilton.	Slate roofs over decks of Main Buildings.	John Dickenson and Edward Dickenson, Jr., of the Village of North Glanford.	Edward Dickenson, Jr., of the Village of North Glanford, and Henry Dickenson, of the Town of Woodstock.	2,550 00	
July 20...	Brock's Monument....	Construction of a shelter and shed.	George Kirkland, of the Village of Queenston	Charles E. Fisher and William Pendergast, both of the Village of Queenston.	750 00	
July 20. .	Agricultural College, Guelph.	Construction of an addition, and repairs to coal-house.	Frederick William Schwendimann, of the Village of Drayton.	Robert Stewart, of the City of Guelph.	867 00	
July 21...	Nipissing District—Registry Office, North Bay.	Whole work	James White, of the City of Ottawa.	Cornelius Neville and Alexander McIntyre, both of the City of Ottawa.	2,635 00	
July 26...	Ottawa Normal School.	Coal	George W. McCullough, of the City of Ottawa.	Henry H. Williams, of the City of Ottawa, and Thomas Raphael, of the same place.	5 25	per ton, Scranton or Pittston, large egg coal.
					7 00	per ton, Briar Hill soft coal.
July 26...	Ottawa Normal School.	Wood	R. Ritchie, of the Town of Aylmer, and T. Ritchie, of the same place.	H. Cole, of the Town of Aylmer, and S. Ritchie, of the same place.	5 00	per cord, hardwood.
					2 50	per cord, pine wood.
Aug. 5...	Parliament and Departmental Buildings and Public Institution, Toronto.	Coal and wood.....	Elias Rogers & Co. (Elias Rogers) of the City of Toronto.	Thomas C. Hutchinson and Samuel Rogers, both of the City of Toronto.	5 60	per ton, Scranton or Pittston, large or small egg.
					5 75	per ton, do., stove or nut size.
					5 25	per ton, Briar Hill.
					4 50	per cord, hardwood.
					3 50	per cord, pine wood.
					1 00	per bbl. charcoal.
Oct. 7	New Parliament and Departmental Buildings, Queen's Park, Toronto.	Brick and masonry work.	Lionel Yorke, of the City of Toronto.	James Farquhar, builder, of the City of Toronto, and Robert Carroll, builder, of the same place.	670,250 00	

(P.W.) 33

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DEPARTMENT OF PUBLIC WORKS, ONTARIO,
TORONTO, *January*, 1887.

J. P. EDWARDS,
Law Clerk.

No. 4.—Statement of Drainage Debentures purchased by the Government, through the Public Works Department, in 1886.

MUNICIPALITY.	NUMBER OF BY-LAW.	AMOUNT.
		$ cts.
Township of Mariposa	321	805 77
" Ekfrid	380	425 00
" "	381	1,389 09
" "	382	1,196 00
" Dunwich	337	766 40
" Malahide	432	400 00
" East Zorra	323	749 83
" Warwick	4 of 1886	880 00
" Mara	172 & 174	1,200 00
United Counties of Stormont, Dundas and Glengarry—(amount of Debentures, $14,714.87)—balance paid in 1886	733	6,714 47
Total		14.526 56

J. P. EDWARDS,

Law Clerk.

DEPARTMENT OF PUBLIC WORKS,

TORONTO, *January*, 1887.

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ADA,

THE

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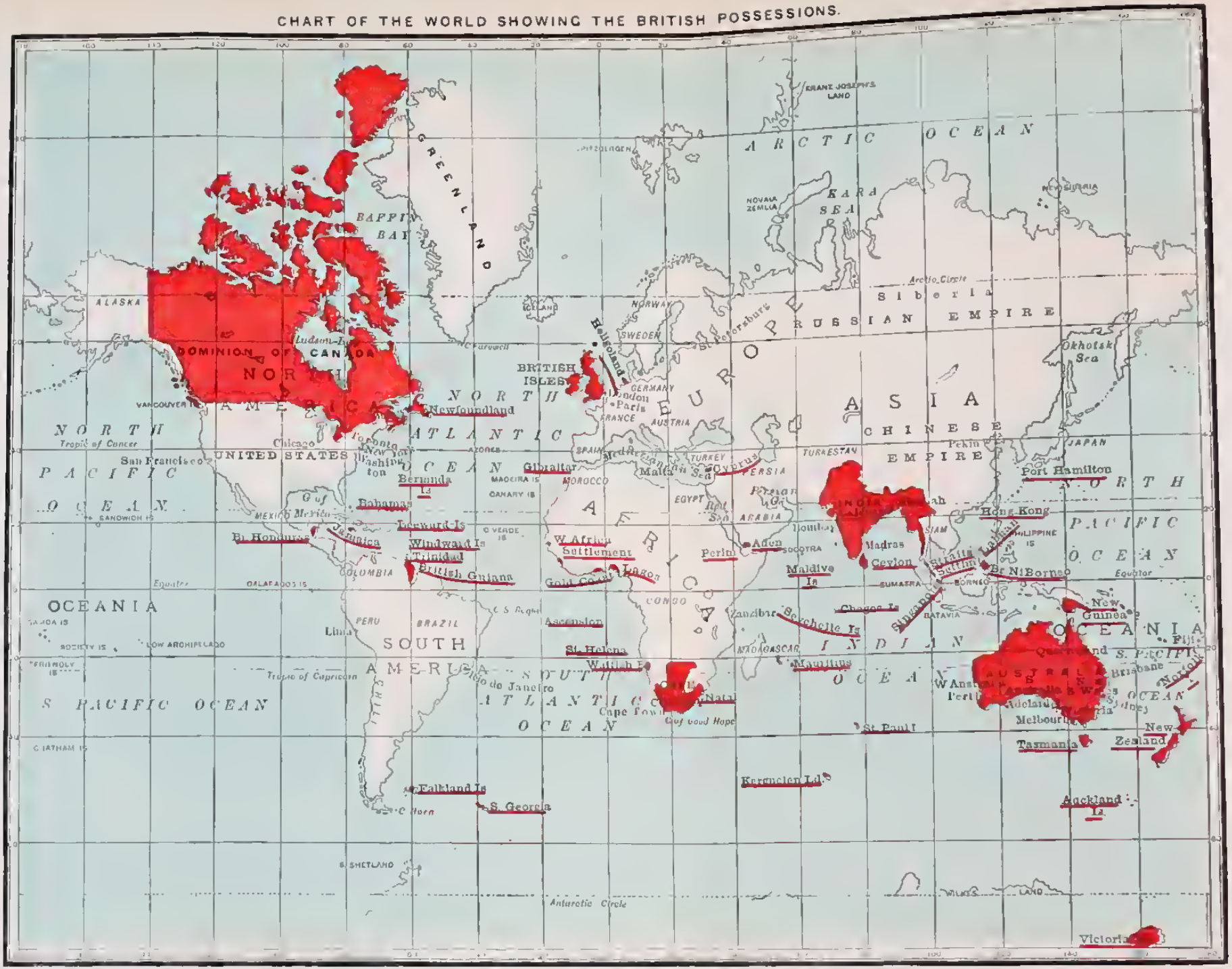
CHART OF THE WORLD SHOWING THE BRITISH POSSESSIONS.



WARWICK & SONS, Printers, 26 and 28 Front St West, Toronto

REPORT

ON THE

SCHOOL APPLIANCES,

PUPILS' WORK, ETC.,

EXHIBITED BY THE

EDUCATION DEPARTMENT OF ONTARIO, CANADA,

AT THE

COLONIAL AND INDIAN EXHIBITION,

LONDON, ENGLAND, 1886.

PUBLISHED UNDER THE DIRECTION OF THE HONORABLE THE MINISTER OF EDUCATION.

BY

S. PASSMORE MAY, M.D., C.L.H.,

Commissioner of Education at Exhibition.

Toronto:

PRINTED BY WARWICK & SONS, 26 AND 28 FRONT STREET WEST.

1887.

EDUCATION DEPARTMENT.

TORONTO, March 1, 1887.

To the Honorable GEORGE W. ROSS, LL.B :

SIR,—I have the honor to present herewith my report on the Educational Exhibits for Ontario at the Colonial and Indian Exhibition, London, 1886. It contains a condensed list of the exhibits of school appliances and pupils' work, with remarks on the fittings and arrangement of the Educational Court of Ontario, together with newspaper notices, reviews, etc., showing the public appreciation of, and the great interest taken in, these exhibits by visitors to the Exhibition.

In addition to the description of Ontario exhibits, I have prepared an Appendix with short historical sketches of each colony and British dependency which took part in the Exhibition, accompanied by a map so colored as to show the British possessions throughout the world ; also a brief notice of the proposed Imperial Institute.

I may remark that about five and a-half millions of people visited the Exhibition, and the Educational Court was daily crowded from the time of opening until its closing ; and there is not the least doubt that the interests of this Province were promoted in Great Britain and on the Continent of Europe by showing the advanced position of education and science in the Institutions under your control.

I have the honor to be, Sir,
Your obedient servant,

S. P. MAY.

INTRODUCTION.

Since the inauguration of the World's Fair in 1851, succeeding International Exhibitions have been held for bringing together people of different nations in peace and amity, to exhibit the productions of their countries and compare with one another the influence of industry, commerce and education on the civilized world; but the Colonial and Indian Exhibition, in a British point of view, is still more important; it is the first imperial display on English soil, showing the resources and capabilities of the Indian Empire, together with the magnitude, vast national wealth, industrial activity and enterprise, and education and culture of the colonies and British possessions, which constitute Greater Britain beyond the seas.

This Exhibition is primarily due to the foresight of H. R. H. the Prince of Wales, whose earnest desire and object has been that the series of exhibitions, held during the past few years at South Kensington, should culminate finally in one great imperial display of the resources and industries of the British colonies and Empire of India. His Royal Highness, as Executive-President of the Royal Commission, at the first meeting of the Commissioners, held March 30th, 1885, said that the project was essentially one of a national and imperial character, differing in this respect from former exhibitions, in which the elements of trade rivalry and profit largely predominated. It was decided that the Exhibition be held in the buildings and grounds at South Kensington, formerly used for the inventories, fisheries and other exhibitions. The governments of the different colonies were corresponded with, and as a rule they heartily co-operated with the scheme, large sums of money were voted and Executive Commissioners appointed for each country.

General regulations were issued by the Royal Commissioners for the guidance of the Executive Commissioners, which gave the latter considerable power. For example, the objects to be exhibited were left entirely to the discretion of the Governments participating, in so far as they illustrated the resources, products and manufactories of the country. There was no charge for space. Motive power and water were supplied free of cost. The Executive Commissioners had entire control of the arrangement of goods, but they had to provide all necessary attendance for keeping the exhibits properly cleaned and in good order, and all expenses connected with display and installation had to be paid by the Executive Commissioners.

On the other hand the Royal Commissioners wielded great power—they received all entrance fees, they insisted that all goods should be left uncovered from 10 a. m. to 10 p. m. on all days except Wednesdays and Saturdays, when the hour of closing was 11 p. m. No exhibit could be removed from the building without the permission of the Executive Commissioner, countersigned by the Secretary of the Royal Commissioners. No exhibit could be photographed without permission of the Secretary of the Royal Commissioners. The Royal Commissioners reserved the right of publishing and selling a general catalogue—any special catalogues had to be sold through the official publishers to the Royal Commissioners. The Royal Commissioners were not responsible for any loss or damage from whatsoever cause arising.

The Exhibition was declared to be opened by Her Majesty the Queen, on Tuesday, May 4th, 1886, in presence of the representatives of her subjects from every corner of the globe, and yet not every corner, as the *Canadian Gazette* says, for, sad to say, one part of British North America, Newfoundland—still isolated, though it would seem naturally intended to complete the existing confederation from Atlantic to Pacific—remained almost

alone among British Colonies in absenting itself from participation in the great family gathering. The first feature in the day's programme consisted of the Royal progress through the Exhibition. Her Majesty was received by H. R. H. the Prince of Wales and Royal Commissioners, and some of the Colonial Commissioners, amongst them Sir Charles Tupper and the Hon. Hector Fabre representing Canada; the procession passed through some of the principal courts and entered the Canadian section in the middle of the central gallery. Facing Her Majesty on her entrance was the large coat of the Royal Arms, belonging to the Education Department of Ontario, lent to the Executive Commissioners for the occasion, Immediately in front of the entrance were arranged tiers of seats for the officers of the executive staff, etc., and in addition a large number of seats were provided throughout the court for Canadian residents and exhibitors. Her Majesty was received in the Canadian Court with enthusiastic cheering, and had a gracious smile and bow for every person. The procession then took a direct route to the Albert Hall, where the inaugural ceremony was held.

H. R. H. the Prince of Wales made a final inspection of the various Courts of the Exhibition on Saturday, May 6th, and expressed himself as much pleased with the Canadian section.

On Friday, May 21st, Her Majesty the Queen, accompanied by H.R. H. the Prince of Wales, Princess Beatrice and the Duchess of Albany, visited the Canadian section, and I had the honor of receiving them at the entrance to the Educational Court.

H. R. H. the Princess Louise and the Marquis of Lorne, as President of the Canadian Commissioners, were frequently in the Exhibition, and took the greatest interest in its progress and completion, and were ever ready to make suggestions or co-operate with Canadians by using their influence in making these exhibits more prominent and attractive.

The English and Foreign press were unanimous in their expression of admiration of the magnitude and commercial value of the Exhibition, and some of them referred to its great importance in a moral aspect, for instance, the *Times* says, "At the time of the first great exhibition, five-and-thirty years ago, it could hardly have occurred to anyone that the British Empire itself could, in the next generation, be capable of furnishing from its own resources an exhibition of the products of its industry, agriculture and fine arts, by the side of which even the great exhibition of 1851 would almost have paled its ineffectual fires. But it is as the symbol of the moral unity of natural sentiments which constitutes a world-wide empire that the Exhibition appeals most strongly to every subject of the Queen.

The *Standard*, after referring to the display being of immense commercial and political value, says, "The fraternity of nations, to accomplish which was the object of the Exhibition of 1851, was a dream; the oneness of the British Empire, as shown by the present show, is a fact."

The *Daily Telegraph* refers to the fact that Canada is now not only within a week of Liverpool, but has supplied in its transcontinential railway a new link with the distant dependencies on the Pacific Ocean.

The *Echo* regards the Exhibition as an event of national importance. "It will," it says, "bring home to the crowds, as nothing has brought home to them before, the greatness of the Colonial Empire of which most Englishmen know so little; and show that if a union of the whole be once placed beyond uncertainty, a career lies before us which may even eclipse our past lustre."

The *Morning Post*, after reviewing the vast changes in the British Empire since the age of exhibitions commenced, remarks that India was still unsettled. New Zealand was the object of contention between English settlers and the Maories, the magnificent colonies of Australia were still but a "dumping ground" for the dregs of the criminal classes of the old country, while Canada was only commencing the work of constructing the networks of railways, which now brings the produce of her most distant fields within reach of the markets of Europe.

Not only the press, but the people themselves, were enthusiastic in their appreciation of the efforts of the colonists to show the world the fruits of their industry, self-reliance and indomitable perseverance. Entertainments were provided for the representatives of

the different countries by royalty, nobility, steamboat, railway and public companies, municipal corporations of various cities and towns, city guilds, manufactories, private individuals, etc. It seemed, in fact, as if all classes of people throughout the country were anxious to acknowledge their blood relationship to their friends from the colonies.

It is not my province to enter into a detailed description of the various exhibits. I shall, therefore, briefly refer to the general Canadian Exhibition, and then point out the principal features of our Educational Exhibit, and finally give a condensed summary of the educational exhibits from the different countries belonging to the British Empire.

The Commissioners in London, representing the Dominion of Canada, were as follows:—

PRESIDENT.

The Marquis of Lorne, K.T., G.C.M.G.

VICE-PRESIDENT.

Viscount Monck, G.C.M.G.

EXECUTIVE COMMISSIONER.

The Hon. Sir Charles Tupper, G.C.M G., C.B.

HONORARY COMMISSIONERS.

The members of the Government of the Dominion, who were in London during the Exhibition:

The Hon. Hector Fabre, C.M.G.

The Hon. Gédéon Ouimet, Superintendent of Education, Quebec.

The Hon. George Kirkpatrick.

The Hon. George W. Ross, L.L.B,, Minister of Education for Ontario.

JOINT SECRETARIES.

Frederick J. S. Dore, Thomas Cross.

ACCOUNTANT.

C. C. Chipman.

The Dominion had over 2,000 exhibitors, and occupied nearly 100,000 square feet of space. Unfortunately this space was very much sub-divided, the original space awarded to Canada was inadequate for the display of all its exhibits, consequently additional space in different parts of the buildings had to be granted from time to time as the goods arrived. It was, therefore, impossible to classify the goods so well as could have been done had all the allotted spaces been in one place. It was, however, a grand display, a practical exemplification of the products, manufactures and education of our great country, and although not fitted up so showily as some of the others, it was universally acknowledged that the exhibition was thoroughly practical, and the decorations neat in design, were so arranged as to harmonise with the exhibits.

The *Times*' remarks, in reference to the area occupied by Canada, are as follows:—

"Had the Dominion kept aloof what a blank there would have been any one can realize who look at a plan of the Exhibition, and see how Canada is spread almost all over the building, from the gateways of British Guiana and the West Indies on the one side to the frontiers of Natal and the Cape on the other, reaching south to the confines of New Zealand and stretching away int the North-West Territories of the arcades and the conservatory. Our American Dominion indeed, occupies quite as much space as our Asiatic Empire, and nearly as much as all the Australian colonies put together. And rightly so, no doubt, for has she not an area of some three million square miles, and can she not look back upon a venerable antiquity of 300 years? Had

she not cities and cathedrals, legislatures and great battle-fields, long before anybody thought of making Botany Bay even a penal settlement? The Canadians have evidently determined that in variety and quantity of exhibits, at least, they shall not be excelled, and, on the whole, they have succeeded. In more than one department they are not approached. In none of the courts i progress in all directions more striking and more patent; none of them—with, perhaps, the exception of India—have richer resources of a solid and enduring character to show; and, all in all, none of them can glory in more marvellous results of human industry."

I may remark, too, that Canada was the only country which exhibited machinery in motion.

The *Leeds Mercury* says:—"Pushing Canada comes out bravely with agricultural products, and with machinery and implements, too, being singular in this latter display, as the other Colonies do not show a score of implements between them. The display, as it is, must fill the ordinary visitor with astonishment, and make him proud of his birthright as a Briton. No other nation in the world could make such a magnificent display of its own products and manufactures.'

Foreign journals have also shown their appreciation of the importance of the Exhibition. Among these is *L'Independance Belge* of Brussels, which says:—"Canada, as large as Europe, covering an area of 2½ million square miles, occupies a prominent place at the Exhibition. Especially in agriculture does it excel. The trophy of grain and fruits is *grandiose*, and one may say as much of the agricultural implements—tools so perfect and so superior to everything made in Europe, that economists are asking why its (Canada's) manufacturers persist in sheltering themselves behind protective duties."

The exhibition opened up considerable newspaper correspondence in regard to foreign and colonial competition. The following extract is from an excellent letter on "Buying goods abroad," by an "Englishman," published in the *Daily Telegraph*:

"I have to submit that England has not only to contend with foreign, but must also be prepared to meet Colonial competition. Many of the Colonies already in several manufactures supply their own wants, some are exporting to other Colonies, whilst some, instead of receiving, are sending finished goods, and not raw material only, to the mother country. The present Exhibition at South Kensington will directly tend to this result. Take the case of Canada: it is generally admitted that the courts allotted to the Dominion are the most practical displays in the whole Exhibition. The machinery hall is always crowded, and the agricultural machines, several of them in motion, attract a great deal of attention. Probably it has surprised many to witness the degree of excellence in their manufacture attained by the Canadians. They boast, I am told, that their machines are superior to any in the world, the American inventions not excepted. The makers are always on the alert to pick up a new idea, which they adopt with no consideration of expense. A great need for labor-saving contrivances has stimulated their production. Here, with an agricultural population in excess of the demand, there has been rather a retarding influence at work, and machines which take the bread out of the mouths of men have been slow to advance in the agriculturist's favor. Thus it has come about that so young a country as Canada can now claim the lead with a unique collection of steam threshers, self-raking reapers, binders, mowers, harvesters, hay-tedders, etc.

The wealth which Canada possesses in her splendid forests has, within the last few years particularly, considerably improved her position as a manufacturing country. The manufacture of doors, sashes, and blinds constitutes an industry especially prosperous in Ontario. There are specimens on view at South Kensington, and the prices are said to be lower than that at which the same kind of articles can be turned out by English carpenters. We import large quantities of ready-made doors from Germany and other parts of the continent, and the question is asked by Canadians, 'Why patronise the foreigner, when we can serve you better?'"

Letters were then published referring to the superiority of German goods which, they said, was owing to the practical and technical education of the German nation.

I immediately put myself in communication with some of the principal newspapers, and endeavoured to show that the improvement in our manufactures and more artistic finish on certain classes of our goods is due to the free education of our people. I referred to our Mechanics' Institutes and Art Schools, also to the specimens of industrial work exhibited, and invited the public to visit the Educational Court and find out for themselves what I consider to be the strong points by which Canada has so prominently and

successfully shown the excellence of her manufactures to the people of older and more wealthy nations.

The following extract on this subject is from the *Canadian Gazette :*

"English journals have recently taken pains to point out how Canadians are excelling in the manufacture of certain implements, and how hard British manufacturers are being pressed by competition here and competition there. Why is this? Must not the cause be sought in the technical and practical education which it is so vital a part of the Canadian, German, and other systems to instil into the young mind? And cannot the superiority of design and execution shown in many branches of Canadian manufactures be attributed to the thoroughness of the educational system adopted by Ontario and other Provinces of the Dominion? In addition to the 5,300 public and separate schools through which the poorer and middle classes in every village, town, city and township, may obtain free education, the system of higher education is such that a boy who is the son of poor parents may, by his own talents, rise from the public school even to the university. In connection with some of the principal public schools the Kindergarten system is in force ; while the various branches taught apply directly to commercial life, and drawing of an industrial character is made compulsory. All-important, too, are the Provincial Normal and Model schools for preparing young men and women for the teaching profession ; the various classical schools designed to furnish a higher English or classical course with modern languages ; the University of Toronto, and the University College ; the technical schools of practical science, art and agriculture ; the schools for the deaf, dumb, and blind ; the institutions partly aided by Government, such as local art schools, artists, mechanics, scientific, and entomological institutions ; and lastly the universities, colleges and schools not under Provincial control. These combine to form an educational system of no ordinary completeness, and one of which Ontario has every reason to be proud. It is one also from which European countries may learn much in the improvement of parts of their own systems."

The Educational Court of Ontario.

On my arrival in England I found that it was impossible to obtain the space in the Central Court for which we had made application, but Sir Charles Tupper gave me the choice of three different spaces. I selected an area of about 3,000 feet floor space in the western gallery, between the New Zealand Court and the Canadian Machinery Department. This proved to be one of the most popular and attractive sections of the whole exhibition. Agricultural implements, etc., in motion was a novelty to the English people, who assembled in large numbers to witness the labour-saving appliances of this country. These crowds of people had to pass through the Educational Court of Ontario in order to visit the New Zealand Court, and in addition the aquarium was adjoining. The consequence was that our Court was continually crowded,and the probability is that hundreds of thousands of visitors had an opportunity of examining our exhibits who might not have seen them had the Educational Court been situated in some other part of the building.

As the space was limited, galleries and divisions were erected which gave several thousands of feet of wall space ; for the protection of apparatus, school work, etc., a large number of glass cases were provided ; the walls, archways, etc., were decorated to harmonise with the exhibits, and the *tout ensemble* was such as to draw enconiums from the British press and educational journals.

The following editorial from the *Globe Colonial Exhibition Supplement*, published soon after the opening ceremony, is a good description of the general appearance of our Educational Exhibit :—

"Ontario is justly proud of her educational system ; for it not only takes first rank in the Dominion, but will also bear comparison with that of many countries in the Old World. That it was most desirable that adequate evidence should be sent to South Kensington of the good work done by and in the Province in this direction, no argument was needed to show ; and the Ontario Government were prompt to recognise, and to endeavor to discharge, the responsibility which devolved upon them. The work of preparing a thoroughly representative and creditable educational exhibit was undertaken with zeal and energy. And, thanks to the enterprise shown by the Provincial Government, to the personal attention given to the task by the Hon. G. W. Ross, Minister of Education, and to the organizing skill and untiring industry of Dr. May, the result is an Educational Court, which is one of the most remarkable features of the Canadian Section, and which has already won high praise from British educational experts.

The Education Department of Ontario, now under the direction of Mr. Ross, controls the Provincial Normal and Model schools ; the county model schools ; and the public, separate, and high schools and collegiate institutes. In addition, it has a voice in the management of all other educational institutions in the Province which receive Government aid for educational purposes ; such, for example, as Upper Canada College, the School of Practical Science, University College, Mechanics' Institutes, Art Schools, etc. In one or more forms all the departments of educational activity are represented at South Kensington. Hence it is not surprising to find that the collection in Dr. May's charge is extremely comprehensive, and occupies to the full the 3,000 feet of space accorded to it. Nor is it a matter for wonder that the special catalogue should form a good sized pamphlet, and should contain a list embracing nearly 3,000 separate entries. Deferring detailed notice of the different divisions of the exhibit, it must suffice on the present occasion to notice briefly its chief features and general arrangement.

The area assigned to Ontario is in the West Gallery, between the New Zealand Court and the space occupied by Canadian agricultural machinery, and immediately adjoining one of the entrances to the Aquarium. From both the New Zealand Section and the machinery gallery, the Ontario Court is separated by artistically designed and decorated archways, which admirably serve the purpose of screens. Above the principal archway—that on the north—the visitor notices at once a large coat of the Royal arms, said, indeed, to be the largest ever exhibited. This is the work of a Torontonian, and was lent from the Educational Court to Sir Charles Tupper, to be placed facing Her Majesty upon her entrance to the Canadian Court on the opening day. Above is a bust of the Marquis of Lorne. On one side of the archway is placed a large photograph of the graduating class of the Ontario Veterinary College, containing some 85 photographs of the students, together with President Smith and the professors. These striking photographs, which attracted the attention of, and were much admired by, the Queen and the Prince of Wales, are supplemented by views of the students' dissecting-room, etc. On the opposite side of the archway, the commercial colleges of the provinces are well represented by specimens of penmanship from Hamilton, Brockville, Owen Sound, etc.

Upon entering the Court, the first thing to strike the eye is the prominently displayed motto, 'Education the Glory of Canada'; whilst on both arches, in equally distinct lettering, are the signs, 'Educational Court, Ontario, Canada.' The rafters supporting the roof are decorated with the maple leaf ; and the southern archway, or screen, it should further be mentioned, is decked with shields of Ontario, surmounted with crowns and ornamented with flags. The Court is divided into five compartments on either side, with galleries above, approached by spiral staircases. Only in this way could Dr. May make separate divisions for each Institution and find space for the very numerous specimens of all kinds committed to his care ; and the general effect of his arrangements is an appearance of completeness and method which is not to be noticed in any other portion of the Canadian Section.

The place of honor in the centre of the Court is rightly assigned to the Educational Trophy. This consists of twelve statistical charts, representing the educational institutions under the control of the Education Department, and mounted on a 12-faced prism. Above the charts, which are quite 6 feet high by 4 feet wide, are placed photographs of the institutions ; and the prism itself is surmounted by a globe 36 inches in diameter, specially colored to show at a glance the extensive territory of Canada. The remainder of the centre of the court is filled with large glass cases, containing philosophical apparatus as used in the Public and High Schools of the Province, including a collection of School Apparatus manufactured by the Map and School Supply Company, Toronto. At the extreme end of the Court are shown astronomical and geographical globes, with plane and raised surfaces, among which we specially notice the Newtonian or Astronomical Globe exhibited by Selby & Co. The anatomical and physiological models also on view here seem to be one of the attractions of the Court, especially the manikin depicting both the external and internal structure of the human body.

The partitions of the side compartments of the Court are surmounted by pedestals supporting busts of distinguished Canadians. Thus the Hon. O. Mowat faces Sir John Macdonald ; the Hon. Geo. Brown has the Hon. J. Beverley Robinson as his *vis-a-vis* ; the Rev. Dr. Ryerson is opposite to to Sir Francis Hincks ; and the Hon. Adam Crooks to Bishop Strachan. As to the contents of the compartments on either side space only permits a few words now being said. About one-half of these contain Maps and Apparatus, the new series of Drawing Books, Text Books, Tablet Reading Lessons, and other school appliances ; the remainder being filled with illustrations of Industrial Art. This display does infinite credit to the province and to the efforts of the Government to promote this branch of study, and is calculated even to a greater degree than the Art Exhibit in the Albert Hall to open the eyes of the British public to Canada's artistic progress of recent years. The Ontario School of Art, the Western School of Art, London, and the Ottawa and the Kingston Art Schools send specimens of every class of work—in oil and water-colors, in freehand drawing, industrial designs, architectural and machine drawing, shading from the flat and from the antique, *repoussé* work, chasing in brass, modelling in clay and plaster casts from clay, electro-metallurgy, and carving in wood. Detailed references, as we

have said above, are out of the question on the present occasion. But mention must be made of the high opinion expressed by competent authorities of the productions in industrial art: of the interest aroused by the specimens of Examination work in the Elementary subjects, such as Geometry, Perspective and Model Drawing, of the admirable water-colors and painting on china, executed by the students of the London School of Art; and of the excellent general work shown from Toronto, Kingston, and Ottawa.

Various other exhibits in this portion of the Court call for brief notice. An educational map of Ontario, on a rather large scale, has both usefulness and novelty to recommend it. Specially marked to show the number of schools of all kinds and other educational institutions in each county, it conveys at a glance an amount of information which could not be fully grasped in any other way with the same ease. Messrs. Williams and Son, of Toronto, show a school piano and organ, which have deservedly gained the attention of many educationists. The public school cabinet organ in particular so admirably meets 'a long felt want,' that its introduction into this country would be hailed with much satisfaction; for this instrument, while sufficiently powerful for outdoor use, or for any ordinary school-room, is so light that it can be carried from room to room by a child ten years of age, and is sold at an extremely low price. Again, the Kindergarten furniture and materials exhibited are of more than ordinary merit, and the ordinary school furniture shown by several makers has already been made the subject of inquiry by many English scholastic authorities. Visitors of all kinds display interest in the specimens of phonotypy sent by Mr. Simpson, of Leamington; in the new series of reading lessons recently introduced; and in the numerous photographic views of the public schools, high schools, colleges, and universities, Toronto School of Medicine, Ontario Pharmaceutical College, etc. The last named, it should be stated, are all labelled, so as to show plainly the name of the institution and of the city or town in which it is situated. The remarks by visitors upon these photographs, which are again and again overheard, testify to the surprise felt at the beauty, size, and number of the buildings the public spirit and wise enterprise of Ontario have provided for educational purposes.

Proceeding now to the galleries, art is prominent on the walls of the right gallery. Here the contributions come from the Ladies' Colleges, at Woodstock, Hamilton, Whitby, Brantford, and St. Thomas, and are as varied as they are excellent in character. The Loretto Abbey, Toronto, and the Loretto Convent, Hamilton, are also exhibitors, and notably furnish some embroidery, lace-work, and painting on velvet and china, whose beauty, both of design and execution, is unquestionable. But the professional educationist will dwell specially upon the work from the public schools of Toronto and other cities and towns, villages and rural schools, which is exhibited here. As Dr. May points out in his most useful and well-arranged catalogue, the very large number of specimens shown represent the ordinary work done by pupils from seven to fourteen years of age, as follows:—Writing, specimens of general work of 416,588 pupils; arithmetic, specimens of general work of 422,076 pupils; and geography and map drawing of 280,953 pupils. The drawings have been taken from the work in progress in the schools in the middle of the term, and are consequently scarcely a fair example of the improvement which can be made in a full session. Nevertheless, the work done in map drawing, for example, is in many cases of astonishing excellence when the age of the pupil is considered. Especially interesting, too, is the whittling in wood by little children, of which many specimens are shown, from Toronto public Schools, including articles of domestic use, such as knives and forks. And this gallery cannot be left without commending the Kindergarten work in connection with the Model School of Toronto, and the Toronto Public Schools.

In the opposite gallery fitting space has been found for specimens of pupils' work, teaching appliances, photographs, etc., from the Ontario Institutions for the Blind and for the Deaf and Dumb. These are in many ways of exceptional interest. The Agricultural College at Guelph is also strongly represented with very large collections of geological, mineralogical, and botanical specimens, samples of seeds and anatomical models, statistical charts, etc., all of which demonstrate the thoroughly practical and scientific training afforded to the students. The *Institut Canadien* sends from Ottawa a variety of specimens of work in the different branches of art. But art here is principally illustrated by the specimens of Industrial Drawing done in the Mechanics' Institutes in the province, of which there is an extremely interesting display. One or two novelties in this division have in addition to be named, to wit, the model of a dram of timber as prepared for running the St. Lawrence rapids, and exhibited by Mr. Anthony Malone, of Garden Island; the working model of an English locomotive, by Mr. Lacey R. Johnson, of Carleton Place, and a marvellous piece of work by Mr. A. Parker (also of Carleton), consisting of a small ornamental inlaid table, fifteen inches in diameter, composed of 1,100 separate pieces of wood.

Brief as is the foregoing outline of Ontario's Educational Exhibit, enough has been said to indicate its exceptional merit and value, and to prove that the bold motto, 'Education the Glory of Canada,' is—in the *premier* province at least—fully justified by the work done in the past, and by the promise held out for the future. Having put their hand to the plough in this matter, Canadians are not likely to turn back. And they are to be congratulated upon the circumstance that the enterprise of the Ontario Government, and the success with which their Commissioner

at South Kensington has discharged his duties, have enabled the British public to grasp these facts more cl arly and fully than was ever possible before."

As soon as the work of installation was completed, a list of the exhibits was put in the hands of the printer, and a catalogue of 76 pages, containing nearly 3,000 separate exhibits, was published. The numbers on the catalogue corresponded with the numbers on the labels attached to the exhibits. Five thousand catalogues were distributed. In addition to the Educational Catalogue, the Canadian Catalogue contains a list of our exhibits, which occupied 25 pages. The Official Catalogue also devoted several columns to our exhibits.

The following is a copy of the Educational Catalogue in a condensed form :—

CATALOGUE.

The Education Department of Ontario, under the direction of the Hon. Geo. W. Ross, LL.B., M.P.P., Minister of Education, controls the Provincial, Normal, and Model Schools ; County Model Schools ; Public, Separate and High Schools, and Collegiate Institutes ; also, Upper Canada College, School of Practical Science, University College, Toronto University, Educational Museum, and Art Schools, Mechanics' Institutes, and all other Institutions receiving Government aid for Educational purposes in the Province of Ontario.

PART I.

NORMAL AND MODEL SCHOOLS, PUBLIC AND HIGH SCHOOLS, AND COLLEGIATE INSTITUTES.

Class 1.—Historical and Statistical.

Annual Reports of the Normal and Model, High and Public Schools of Ontario, from 1845 to 1885.
Special Educational Reports, 1868 to 1876.
Journal of Education for Ontario, from 1848 to 1877.
Statutes and Regulations respecting Public and High Schools, 1885.
Revised Statutes of Ontario, 2 vols.
Ontario Educational Exhibit at Philadelphia in 1876, by J. G. Hodgins, LL.D., Deputy-Minister.
Catalogue of the Museum of the Education Department of Ontario, by S. P. May, M.D., Superintendent.
Educational Trophy, consisting of 12 Statistical Charts, each 6 feet by 4 feet, with large Photographs of Buildings mounted on a 12-faced prism, surmounted by a cylinder, supporting a 36-inch Globe so colored as to show the extensive territory of Canada.
The Charts are as follow :—
Progress of the Public Schools of Ontario in forty years.
Progress of the Collegiate Institutes and High Schools in twenty-five years.
Statistics for 1886 of County Model Schools, Training Institutes, and Teachers' Institutes.
Statistics for 1886 of the Ontario School of Art, Education Department, Toronto.
Statistics for 1886 of the Mechanics' Institutes and Free Public Libraries in Ontario.
Statistics for 1886 of University College and the University of Toronto.
Statistics for 1886 of the School of Practical Science, Toronto.
Statistics of Upper Canada College, Toronto.
Statistics of Ontario Agricultural College, Guelph.
Statistics of Ontario Institution for the Education of the Blind, Brantford.
Statistics of Ontario Institute for the Deaf and Dumb, Belleville.

Map of the Province of Ontario, showing the Public Schools, Separate Schools, High Schools, Collegiate Institutes, Universities and Colleges.

Grip Publishing Company, Toronto.

Education Weekly, from July to December, 1885.

CLASS 2.—SCHOOL METHOD AND ORGANIZATION.

Public School Daily Register for recording the Attendance of Pupils.
Register of Daily Attendance, etc., in High Schools and Collegiate Institutes.
Honor Rolls for High and Public Schools.
Examination Papers for Provincial Certificates, Entrance Examinations, etc.
Text Books on the History and Science of Education.
Manual of Hygiene for Schools and Colleges, Education Department, Toronto.
Scripture Readings for High and Public Schools, authorized by the Education Department.

CLASS 3.—SCHOOL ARCHITECTURE AND PHOTOGRAPHS OF SCHOOL BUILDINGS.

Hints and Suggestions on School Architecture and Hygiene, with 75 Plans and Illustrations, for the use of School Trustees in Ontario, prepared under the direction of the Hon. the Minister of Education, by J. Geo. Hodgins, LL.D., Deputy-Minister.

Photographs of Schools, Colleges, etc.

Normal and Model Schools :—

Normal and Model Schools, Toronto.
Do. do. Ottawa.

Public Schools :—

Brantford—Central School, East Ward School, North Ward School, King's Ward School.
Goderich—Central School, Public School.
Hamilton—Public School, Ward Public School.
Ingersoll—Central School.
London—Central School, Hamilton Road School, Princess Avenue School, Rectory Street School.
Morrisburg—Public School.
Napanee—Public School.
Ottawa—Central School, Central Public School (East), Victoria Ward Primary School.
Peterborough—Roman Catholic Separate School for Boys.
Toronto—Ryerson Street School, Wellesley Street School. Dufferin Street School, Hope Street School, Victoria Street School, Jesse Ketchum School, Bolton Avenue School.
Woodstock—Central Public School.

Indian Schools :—

Sault Ste. Marie—Shingwauk Home for Indian Boys.
Do. Wananosh Home for Indian Girls.

Union High and Public Schools :—

Belleville, Port Perry.

High Schools :—

Goderich, Morrisburg, Stratford, Woodstock.

Collegiate Institutes :—

Brantford, Guelph, Ingersoll, Ottawa, Peterborough, St. Catharines, Toronto.

CLASS 4.—SCHOOL FURNITURE AND FITTINGS.

Bennet Furnishing Company, London.

Style A Bennet Desk and Seat, 3 sizes ; Style B Bennet Desk and Seat, 3 sizes ; Bennet Grammar School Locked Desk.

W. Stahlschmidt, Preston.

Teacher's Desk, Marvel School Desk ; Single Rear Seat for same ; Marvel School Desk, 4 sizes ; Model School Desk, Improved Favorite School Desk.

Map and School Supply Company, Toronto.

(See also Map and Apparatus Departments.)

Numeral Frame, with Blackboard ; Numeral Frame on Stand ; Sheepskin Eraser for Blackboard ; Fluted Eraser for Blackboard.

CLASS 5.—KINDERGARTEN MATERIAL.

Selby & Co., Toronto.

(See also Drawing Models.)

Kindergarten Tables, with tops marked in inch squares ; Kindergarten Chairs, (6 Chairs colored to represent the primary colors) ; Kindergarten Toys, etc.

CLASS 6.—PHYSICAL EDUCATION.

Maclaren's Physical Education.

Gymnasium, with the necessary Apparatus to perform the Gymnastic Exercises in Movements and Positions, Exercises of Progression, etc., Dumb Bells, Indian Clubs.

CLASS 7.—TEXT-BOOKS.

Authorized for use in Public Schools in following Subjects (for list see Special Catalogue) :—

Reading and English Literature, 8 vols.; Book-keeping, 2 vols.; Arithmetic, 4 vols.; Geography, 7 vols.; Grammar and Composition, 7 vols.; History, 4 vols.; Algebra, 4 vols.; Geometry, 3 vols.; Chemistry and Agriculture, 2 vols.; Natural

Philosophy, 4 vol.; Elementary Physics, 3 vols.; Agriculture, 1 vol.; Music, 1 vols.; Drawing, 5 vols.

Copp, Clark & Co., Toronto.

Readers authorized by the Minister of Education.
First Book mounted on cards.
Reading Lessons to accompany First Book mounted on cards.
Mercantile Graded Copy Books.

Canada School Publishing Company, Toronto.

Coleridge's "Ancient Mariner" and selected Minor Poems.
Ayres' and Armstrong's Verbalist.
Ayres' and Armstrong's Orthoëpist.
Swinton's Language Lessons.
Williams' Composition and Practical English.
Jeffers' History of Canada.
Thompson's History of England.
Collier's History of British Empire.
Morrison's Trigonometry.
Royal Canadian Readers.
Beatty's Ontario Writing Course.
Tuft's and Preston's Public and High School Music Readers.
Canadian Drawing Course, 5 books.
Set of Charts for Drawing Books.
Set of Drawing Books mounted in frames.

Warwick & Sons, Toronto.

Physical Culture, by E. B. Houghton.
School Management, by Baldwin and Dawson.
English Literature for High Schools.

Text-Books authorized for use in High Schools and Collegiate Institutes in following subjects (for list see Special Catalogue) :—
English, 14 vols.; Latin, 8 vols.; Greek, 7 vols.; French, 11 vols.; German, 4 vols.; Mathematics, 18 vols.; History, Geography and Antiquities, 17 vols.: Physical Science, 17 vols.: Miscellaneous 10 vols.

Class 8.—Reading Charts, &c.

Copp, Clark & Co., Toronto.

Reading Lessons to accompany authorized series of Reading Books.
Calkin's Phonetic Charts for Self-Training in the Sounds of Language.

Caleb P. Simpson, Leamington.

Set of 11 Tabulated Phonetic Alphabet Charts.

CLASS 9.—DRAWING MODELS, &C.

Set of Drawing Models. (Department of Science and Art.)
Set of Geometrical Drawing Models.
Model of Bridge, Door and Steps, Step-Ladder, Gate, Well, House, etc.
Models of Fruit, beautifully colored from nature.
Terra-cotta Models of Fruit, Leaves, etc.
Bail's Drawing Charts (set of 19.)

Selby & Co., Toronto.

(See School Furniture.)

Primary Drawing Models, Canadian Drawing Models, Geometrical Figures.

CLASS 10.—MUSIC.

R. S. Williams & Son, Toronto.

Public School Cabinet Organ, solid black walnut case, three and quarter octaves, having one set of reeds thoroughout, with double bellows, two blowing pedals and knee swell.

This instrument is sufficiently powerful for out-door exercises, or for any ordinary schoolroom, and is so light that it can be carried from room to room by a child ten years of age.

Public and High School Piano, walnut oil finished case.

Canada School Publishing Company, Toronto.

(See also Text-Books and Drawing.)

Tuft's and Preston's Public School Music Reader.
Tuft's and Preston's High School Music Reader.
Normal Music Course, first series (20 large charts printed on both sides.)

CLASS 11.—GEOGRAPHY AND ASTRONOMY.

Topographical Illustrations—Terrestrial Globes :—

30-inch Terrestrial Globe.
18-inch do bronze pedestal stand.
12-inch do bronze frame.
6-inch do brass frame.
5-inch Terrestrial Hemisphere Globe.
3-inch do do.

Raised and Physical Globes :—

12-inch Physical Globe.
15-inch Raised Globe.
18-inch do

Maps, etc :—

Johnston's England, Ireland, Scotland, British Isles and Australia.
Nelson's British America, Palestine and Lands of the Bible.
Departmental Maps of Palestine and Bible Lands.

Raised Maps :—

North America.
Map of Europe.
Map of Italy.
Greciæ Antiquæ.

Map and School Supply Company, Toronto.

School Maps (see also Apparatus and School Furniture Departments)—Europe, Asia, Africa, America, Dominion of Canada and Ontario.
Map Case containing 5 Maps.

Canada School Publishing Company, Toronto.

Hughes' Railway Map of Ontario.

Astronomical Illustrations—Celestial Globes, Orreries, etc:—

18-inch Celestial Globe.
12-inch Celestial Globe.
Solar Telluric Globe.
Juvet's Time Globe.
Ginn's 6-inch Astronomical Globe.
Swain's Planetarium.
Planetarium High Stand.
Planetarium Low Stand.
Brass-ground Tellurian.
The Heliotellus.
The Lunatellus.
Tide Dial.
Bailey's Astral Lantern.
Astronomical Lantern.

Selby & Co., Toronto.

Newtonian or Astronomical Globe.

Astronomical and Physical Maps and Charts:—

Johnston's Solar System.
do Astronomical Diagrams.
Astronomical Charts (set of 16.)
Drew's Astronomical Charts (set of 12.)
Reynolds' Astronomical Geography.
do Chart, Distribution of Rain.
do Principal Rivers of the World.
Guizot's Mural Map of North America.

Class 12.—Chronology.

Chronological Chart of Ancient History.
Genealogical and Chronological Chart of the History of England.
Genealogical Chart of the Sovereigns of England, showing their respective titles to the Crown.
Historical Chart, showing the rise, progress, and decline of Commercial Nations, 1506 B. C. to A. D. 1870.
Merritt's Historic Tree of British North America.
Nasmith's Chronometrical Chart of the History of England.
Genealogical Tree of the Royal Family of Great Britain.

Class 13.—Ethnography.

Portrait Busts of Distinguished Canadians (from the Educational Museum):—

Marquis of Lorne, Governor-General of Canada from 1878 to 1882.
His Honor John Beverley Robinson, Lieutenant-Governor of Ontario, born 1820.
Right Hon. Sir John A. Macdonald, G.C.B., Premier of Dominion of Canada, born 1815.
Hon. Oliver Mowat, Q.C., Premier of Ontario, born 1820.
Hon. George Brown, Senator, born 1818, died 1880.
Sir Francis Hincks, K.C.M.G., born 1807, died 1885.
Hon. T. D'Arcy McGee, M.P., born 1825, died 1868.

Rev. Egerton Ryerson, D.D., L.L.D., Chief Superintendent of Education, born 1803, died 1880.
Hon. Adam Crooks, first Minister of Education for Ontario, born 1827, died 1886.
Right Reverend John Strachan, D.D., L.L.D., first Bishop of Toronto, born 1778 died 1867.
Portraits of Indians (set of 58, colored.)

CLASS 14.—ANATOMY AND PHYSIOLOGY.

Models :—

Manikin—a model of the Human Body, showing both external and internal structure.
Thorax, showing organs of circulation, respiration, etc.
Head and Neck (3 models).
Brain (4 models).
Ear, enlarged, showing its structure.
Lower Jaw, enlarged, showing teeth, nerves, arteries, etc.
Skin, enlarged, showing epidermis, perspiratory glands, arteries, nerves, etc.
Heart, enlarged and movable, showing valves, etc.
Tongue and Epiglottis.
Larynx (2 models).
Bones of Foot, Hand, Elbow Joint- Shoulder Joint, Knee Joint, and Hip Joint.

Anatomical and Physiological Charts :—

Fiedler's Anatomical Charts (set of 4).
Marshall's Physiological Diagrams (set of 9).
Johnston's Anatomical and Physiological Charts (set of 2).

CLASS 15.—ZOOLOGY.

Audubon's Animals of North America (chiefly of the natural size) beautifully colored from nature, with common and technical names.

Zoological Diagrams :—

Patterson's Zoological Diagrams (set of 10).
Johnston's Illustrations of Natural History (set of 5).
Redfield's General View of the Animal Kingdom.
Simonson's Circular Zoological Chart.
Hawkins' Extinct Animals (set of 5).
Christian Knowledge Society, Comparative sizes of Animals.

Normal and Model Schools, Ottawa.

Collection of Corals.

CLASS 16.—BOTANY.

Botanical Charts :—

Henslow's Botanical Charts.
Departmental Set of Botanical Plates.
Johnston's Botanical Charts.
Vegetable Kingdom—Flowering plants or Phanerogamia, and Flowerless Plants or Cryptogamia (set of 70).
Apparatus for Collecting Plants.
Set of 45 Colored Botanical Plates to illustrate Order Orchidaceæ.

Set of 28 Models of Flowers, which can be taken apart to illustrate Physiological Botany.
Set of 90 Object Lessons from Vegetable Kingdom.

CLASS 17.—GEOLOGY AND MINERALOGY.

Geological Charts :—

Reynolds' Table, showing the order of succession of Stratified Rocks.
Reynolds' Table of British Strata.
Morris's Geological Chart.
Set of Models of Crystals in glass.
Set of Models of Crystals exemplifying the primary forms.

CLASS 18.—PHILOSOPHICAL CHARTS.

Johnston's Philosophical Charts (set of 7).

CLASS 19.—PHYSICAL AND CHEMICAL APPARATUS.

Matter, Force, and Motion :—

Mercury Tube and Cup for Porosity.
Inertia Apparatus.
Apparatus for illustrating Curvilinear Motion,
Bent Lever.
Double Inclined Plane.
Collision Balls.
Model of Screw.
Model of Lock.
Gyroscope.
Centrifugal Machine.
Set of Mechanical Powers.

Gravitation and Molecular Attraction :—

Centre of Gravity Apparatus.
Physical and Chemical Balance, in glass case.
Guinea and Feather Apparatus.
Coulomb's Torsion Balance.

Hydrostatics :—

Haldat's Liquid Pressure Apparatus.
Equilibrium Tubes.
Capillary Tubes.
Apparatus to illustrate Spouting of Fluids.
Hydraulic Ram.
Hydraulic Press with lever.
Bramah Press.
Cartesian Divers.
Hydrometers.
Specific Gravity Flasks.
Model of Archimedes Pump.
Under and Overshot Wheel.

Properties of Gases :—

Air Pump with two glass cylinders, syphon gauge, and bell glass receiver, mounted on a table.
Air Pump with brass cylinder.
Condensing Syringe.
Copper Globe for Exhaustion to form Fountain.
Model of Suction or Lifting Pump.
Model of Force Pump.
Magic Funnel.
Transfer Jar for Exhaustion under Bell Glass.
Fountain in Vacuo, with Jet, etc., for producing an Artificial Fountain.
Magdeburg Hemispheres.

Daniell's Hygrometer.
Reynolds' Chart of Barometer.
Marriotte and Boyle's Instrument for Measurement of the Elastic Forces of Gases.
Apparatus for Mixture of Gases and Liquids.

Acoustics:—

Bell in Glass Globe to show that sounds are not produced in vacuo.
Sliding Rod and Ball, with Glass Receiver.
Water Hammer.

Heat: (see also Chemical Apparatus):—

Tyndall's Apparatus—Multiplying Wheel.
Ingenhouz's Apparatus.
Tyndall's Apparatus to show Unequal Expansion of Metals.
Gravesande's Ball and Ring Pyrometer.
Ferguson's Pyrometer.
Wollaston's Cryophorus.
Differential Thermometer.
Gridiron Pendulum.
Franklin's Experiment (Pulse Glass).
Radiometer.
Psychrometer (Wet Bulb Thermometer).
Thermo-electric Battery or Pile.
Mellom's Thermo Multiplier with concave reflector.
Concave Reflectors.
Model of Locomotive Engine.
Model of Beam Engine and Boiler.
Miniature Working Model of Steam Engine.

Light:—

Large Binocular Microscope with movable diaphragm, fine adjustment, two sets of eye-pieces, nine objectives, achromatic condenser, rotating prism, etc., etc.
Public School Microscope for Botanical purposes.
Magic Lantern with 3½-in. lenses.
Polarising Apparatus for Magic Lantern.
Solar Lantern.
Photogenic Lantern for Electric Light Apparatus.
Condensing Lenses.
Terrestrial Telescope on Stand.
Davey's Safety Lamp.
Revolving Disc for Decomposition of Light.
Camera Obscura.
Kaleidoscope.
Oxy-hydrogen Lamp.

Magnetism:—

Inclination Compass for Measuring the Magnetic Inclination or Drop.
Horse-shoe Magnets.

Frictional Electricity:—

Carre's Electrical Machine.
Plate Electrical Machine.
Holtz's Electrical Machine.
Electrophorus, glass handle.
Electric Battery of Leyden Jars.
Electrical Discharger, Electrical Plate, Electrical Orrery, Electrical Sportsman, Electric Egg, Electrical Vane, Electric Head of Hair, Electric Pistol.

Cuthbertson's Balance Electrometer.
Dancing Image Plates.
Glass Globe for Dancing Images.
Coulomb's Ellipsoid (see Heat).
Apparatus for Light in Vacuo.
Illuminated Egg Stand.
Globe for Electric Spark.
Diamond or Luminous Jars.
Leyden Jars.
Spiral or Spotted Tubes.
Harris's Unit Jar.
Thunder House.

Dynamical Electricity :—

Bunsen's Battery.
Carbon Battery.
Grove's Battery.
Smee's Battery.
Decomposition of Water Apparatus.
Electric Magnetic Bell.
Electric Pump.
Electro-magnetic Machine.
Electrotyping Apparatus.
Geissler's Tubes.
Apparatus for revolving Geissler's Tubes.
Mirror for Geissler's Tubes.
Hoffman's Apparatus for Electrolysis.
Helix and Bar.
Large Ruhmkorff Coil.
Commutator or Contact Breaker for ditto.
Ruhmkorff Coil with commutator.
Oersted's Galvanometer.
Stand for Carbon Points for Electric Light.
Revolving Electro Magnet.
Revolving Armature and Magnet.
Model of Electric Telegraph with index.
Model of Electric Telegraph for Sound.
Home and School Telegraph.
Telegraph with Paper Reel.
Mariner's Compass.

Chemistry :—

School Laboratory.
Apparatus for Experiments with Gases.
Apparatus for applying Heat.
Miscellaneous Chemical Apparatus.

Map and School Supply Company, Toronto. (See also School Furniture and Map Departments.)

Public School Air Pump.
Bell Glass for ditto.
Air Pump with 6-inch plate.
Bell Glass for ditto.
Guinea and Feather Apparatus.
Magdeburg Hemispheres.
Model of Lifting Pump.
Model of Force Pump.
Ramsden's Electrical Machine.
Leyden Jars.
Spiral or Spangled Tubes.
Electrical Discharger.
Dancing Image Plates.
Electrical Flier.
Electrical Pendulum.
Insulating Stool.
Electrolysis Apparatus.
Induction Cylinders.
Gyroscope.
Archimedes Principle.
Conductometer.
Ball and Ring Pyrometer.

CLASS 20—PUPILS' WORK—KINDERGARTEN.

Pupils' Work.—*Provincial Model School, Toronto.* Conducted by Miss Hailman.

Beads (Miss Hailman's 2nd gift) :—Examples to show Color, Form, Color and Form.

Chains :—Examples in Straws, Papers and Links.

Stick-laying :—Examples of same.

Parquetrie :—Examples of Tablet-laying.

Folding—Forms of Cognition :—Examples of Square Folding (1st School); Oblong Folding (2nd School); Triangular Folding (3rd School); Geometrical Folding; Groups of Geometrical Folding.

Weaving Mats :—Examples to illustrate Color, Form, Color and Form.

First Steps in Invention (Miss Hailman's Baby Mats.)

Cutting and Pasting:—Simple School, founded on square inches.

Sewing:—Set of Bradley's Sewing Cards.

Freehand Weaving:—Examples of Cards and Baskets.

Interlacing:—Examples of Interlacing,

Kindergarten Work, Toronto Public Schools.

I. Exhibit of Training Class, conducted by Mrs. James L. Hughes.

	Specimens
Paper Cutting and Pasting—(*a*) Designs from the Square	20
(*b*) " " Hexagon	20
Free Cutting	5
Mat Weaving—(*a*) Regular Weaving	40
(*b*) Original Symmetrical Patterns	9
(*c*) Woven Pictures	9
Sewing—(*a*) Picture Sewing	9
(*b*) Symmetrical Designs	9
Paper Folding—One-inch square Foldings, grouped to form a Tea Set.	5
Paper Interlacing	20
Perforating—Embossed Designs	16

II. Children's Work.

Mat Weaving—(*a*) Counting Patterns	24
(*b*) Form Patterns	12
Free Weaving	20
Paper Folding	21
Sewing—Picture Cards	30
Perforating—(*a*) Picture Outlines	20
(*b*) Symmetrical Designs	9

CLASS 21.—PUPILS' WORK—PUBLIC AND SEPARATE SCHOOLS.

(Number of Schools in operation, 5,316.)

This section of the Catalogue represents the ordinary work done by children from 7 to 14 years of age in the following departments:—

Writing:	Specimens of general work of	416,588 pupils.
Arithmetic:	" "	422,076 "
Geography:	" Map Drawing of	280,953 "

Map Drawing is taught simultaneously with the Text-Books in Geography,

Drawing: Specimens of Drawing-Books and Drawings, general work of 245,821 pupils.

The names of Schools only are given; for details see Special Catalogue.

I.—COUNTIES.

Brant Co. (Pupils' Work).
Mount Pleasant.

Carleton Co. (Pupils' Work).
S.S. 2 Goulbourn.
S.S. 4 Goulbourn.
S.S. 4 Gower, N.
S.S. 5 Huntley.
S.S. 3 Nepean.
S.S. 4 Nepean.

Dundas Co. (Pupils' Work).
S.S. 1 Inkerman.
S.S. 9 Matilda.
S.S. 7 Mountain.
S.S. 18 Mountain.
S.S. 4 Williamsburg.
S.S. 9 Williamsburg.
S.S. 12 Williamsburg.
S.S. 22 Williamsburg.

I.—Counties.—*Continued*,

Dundas Co. (Pupils' Work).
S.S. 1 Winchester.
S.S. 2 Winchester.
S.S. 4 Winchester.
Durham Co. (Pupils' Work).
S.S. 2 Cavan.
Essex Co. (Pupils' Work).
S.S. 2 Colchester, N.
S.S. 2 Colchester, S.
S.S. 4 Gosfield.
S.S. 2 Malden.
Frontenac Co. (Pupils' Work).
S.S. 7 Portland.
Halton Co. (Pupils' Work).
S.S. 6 Esquesing.
S.S. 10 Esquesing.
S.S. 11 Esquesing.
S.S. 5 Nassagaweya.
S.S. 6 Nelson.
S.S. 12 Nelson.
S.S. 5 Trafalgar.
S.S. 10 and 18 Trafalgar.
S.S. 11 Trafalgar.
S.S. 14 Trafalgar.
Haldimand Co. (Pupils' Work).
S.S. 6 Caledonia.
S.S. 2 Canboro'.
S.S. 5 Cayuga, S.
Decewsville.
S.S. 2 Dunn.
S.S. 4 Dunn.
Hagarsville.
S.S. 2 Moulton.
S.S. 6 Seneca.
Springvale.
S.S. 1 Walpole.
S.S. 6 Walpole.
S.S. 16 Walpole.
York.
Hastings Co. (Pupils' Work).
Plainfield.
S.S. 6 Sidney.
S.S. 11 Thurlow.
Huron Co. (Pupils' Work).
Blyth.
Kent Co. (Pupils' Work).
S.S. 2 Chatham
S.S. 7 Chatham.
S.S. 12 Chatham.
S.S. 2 Dover.
S.S. 13 Dover.
S.S. 7 Raleigh.
S.S. 9 Raleigh.
S.S. 1 Romney.
S.S. 3 Romney, N.
Kent Co. (Pupils' Work).
S.S. 2 Tilbury, E.
S.S. 4 Tilbury, E.
Lambton Co. (Pupils' Work).
S.S. 2 Euphemia.
S.S. 2 Warwick.
Lanark Co. (Pupils' Work).
Fullbrook.
Leeds (Pupils' Work).
Delta.
Farmersville.
Lennox and Addington Cos. (Pupils' Work).
Big Creek.
S.S. 3 Camden.
S.S. 6 Camden.
S.S. 4 Ernestown.
S.S. 6 Ernestown.
Hamburg.
Millhaven.
Morven.
Napanee Mills.
Odessa.
Lincoln Co. (Pupils' Work).
S.S. 7 Caistor.
S.S. 2 Gainsboro'.
S.S. 10 Gainsboro'.
S.S. 5 Grantham.
S.S. 2 Louth.
S.S. 3 Louth.
S.S. 4 Louth.
S.S. 4 Niagara.
S.S. 6 Niagara.
Middlesex, E., Co. (Pupils' Work).
S.S. 3 Biddulph.
S.S. 4. Dorchester.
S.S. 19 London.
S.S. 22 London.
S.S. 2 Nissouri, W.
Odell's, Westminster.
Oneida Indian School.
S.S. 2 Westminster.
S.S. 17 Westminster.
Norfolk Co. (Pupils's Work).
Waterford.
Ontario Co. (Pupils' Work).
S.S. 4 Mara.
Manilla.
S.S. 1 Whitby, E.
Prince Edward Co. (Pupils' Work).
S.S. 10 Ameliasburg.
S.S. 2 Athol.
S.S. 5 Athol.
Consecon.
S.S. 10 Hillier.

I.—Counties—*Continued.*

Prince Edward Co. (Pupils' Work).
S.S. 2 Marysburg, N.
Milford.
Renfrew Co. (Pupils' Work).
S.S. 2 Algona, N.
S.S. 3 Algona, S.
S.S. 1 Alice.
S.S. 6 Alice.
S.S. 3 Bagot.
S.S. 5 Bagot.
S.S. 2 Bromley.
S.S. 2 Brudenell.
Forester's Falls.
S.S. 2 Grattan.
S.S. 8 Grattan.
S.S. 2 Horton.
S.S. 10 McNab.
S.S. 13 McNab.
S.S. 2 Petawawa.
Rankin.
Rockingham.
S.S. 4 Ross.
S.S. 9 Ross.
Simcoe Co. (Pupils' Work).
S.S. 1 Adjala.
S.S. 5 Adjala.
S.S. 6 Adjala.
Bondhead.
S.S. 1 Essa.
S.S. 4 Essa.
S.S. 5 Essa.
S.S. 6 Essa.
S.S. 8 Essa.
S.S. 10 Essa.
S.S. 11 Essa.
S.S. 15 Essa.
S.S. 1 Gwillimbury, West.
S.S. 4 Gwillimbury, West.
S.S. 16 Gwillimbury, West.
S.S. 6 Innisfil.
S.S. 8 Innisfil.
S.S. 10 Innisfil.
S.S. 11 Innisfil.
S.S. 13 Innisfil.
Simcoe Co. (Pupils' Work).
S.S. 1 Medora.
S.S. 4 Tecumseth.
S.S. 8 Tecumseth.
S.S. 9 Tecumseth.
S.S. 17 & 13 Tecumseth and Essa.
S.S. 2 Tossorontio.
Tottenham.
S.S. 1 Watt.
Waterloo Co. (Pupils' Work).
S.S. 19 Dumfries, N.
S.S. 25 Dumfries, N.
S.S. 5 Waterloo.
S.S. 17 Waterloo.
Welland Co. (Pupils' Work).
Port Robinson.
Wellington Co. (Pupils' Work).
S.S. 3 Eramosa.
S.S. 13 Erin.
S.S. 1 Garafraxa, W.
S.S. 9 Garafraxa, W.
Glenallan.
S.S. 1 Guelph.
S.S. 4 Guelph.
S.S. 4½ Guelph.
S.S. 6 Guelph.
S.S. 1 Luther West and Garafraxa W.
S.S. 12 Minto.
Parker.
S.S. 4 Pilkington.
S.S. 5 Pilkington.
S.S. 1 Puslinch.
S.S. 2 Puslinch.
S.S. 4 Puslinch.
Salem.
Speedside.
York Co. (Pupils' Work).
S.S. 4 Gwillimbury, E.
S.S. 4 King.
Pottageville.
S.S. 3 Vaughan.

II.—Cities (Pupils' Work).

Belleville.
Brantford Central Sch.
Hamilton.
London Sep. Sch.
Ottawa Sep. Sch.
St. Catharines Sep. Sch.
Stratford.
Toronto.
Toronto Sep. Sch.

III.—Towns (Pupils' Work).

Amherstburg.
Brockville.
Berlin.
Listowel.
Milton.
Napanee.

III.—Towns (Pupils' Work)—*Continued.*

Bowmanville.
Bowmanville Union Sch.
Blenheim.
Barrie.
Brampton.
Chatham Central Sch.
Cornwall Sep. Sch.
Newmarket.
Pembroke.
Port Hope.
Picton.
Port Hope.
Port Hope Union Sch.
Trenton.

IV.—Villages (Pupils' Work).

Alliston.
Arnprior.
Bath.
Burlington.
Caledonia.
Carleton Place.
Drayton.
Dunnville.
Fergus.
Gananoque.
Gravenhurst.
Hespeler.
Iroquois.
Leamington.
London West.
Newcastle.
Newboro'.
Preston.
Port Dalhousie.
Richmond.
Stirling.
Uxbridge.
Wellington.

Provincial Normal and Model Schools (Pupils' Work).

Toronto Normal School.
Do Model School.
Ottawa Normal School.
Do Model School.

High Schools and Collegiate Institutes (Pupils' Work).

Aylmer.
Belleville.
Bradford.
Brockville.
Caledonia.
Chatham.
Fergus.
Gananoque.
Hamilton.
Kemptville.
Kincardine.
London.
Morrisburg.
Orangeville.
Owen Sound.
Parkhill.
Port Perry.
Port Dover.
Picton.
St. Thomas.
St. Mary's.
Stratford.
Strathroy.
Streetsville.
Whitby.
Woodstock.

PART II.

MECHANICS' INSTITUTES.

Specimens of Examination Papers on Drawing, from the following Mechanics' Institutes:—

Aurora.	Goderich.	Prescott.
Ailsa Craig.	Guelph.	Preston.
Almonte.	Kemptville.	Penetanguishene.
Arnprior.	Mount Forest.	Richmond Hill.
Barrie.	Milton.	St. Catharines.
Brantford.	Midland.	Schomberg.
Berlin.	Mitchell.	St. George.
Blyth.	Newmarket.	St. Mary's.
Brockville.	Napanee.	Seaforth.
Carleton Place.	Orangeville.	Stouffville.
Cheltenham.	Orillia.	Smith's Falls.
Claude.	Paris.	Strathroy.
Durham.	Parkhill.	Stratford.
Elora.	Perth.	Streetsville.
Galt.	Peterboro'.	Whitby.
Garden Island.	Port Perry.	Woodstock.
Georgetown.		

Association of Mechanics' Institutes for Ontario.

W. Edwards (Secretary of Association), Toronto.

Roll and Record Books.—Accession Books.

Carleton Place Mechanics' Institute.

Pupils' Work.—Machine Drawing, etc.

Lacey R. Johnson, Carleton Place.

Working Model of English Locomotive Engine, made to scale of one inch to the foot.

A. Parker, Carleton Place.

Ornamental Inlaid Wood Table.

Jas. McVety, Carleton Place.

Model of Dwelling House or Shanty, as built by the early settlers in Canada.

Guelph Free Library.

J. O'Brien, and students, Guelph.

Ornamental Carving in Wood.

Garden Island Mechanics' Institute.

Archd. Cumming, Garden Island.

Working Model of a Harbour Tug Steam Engine.

Anthony Malone, Garden Island.

Model of a Dram of Timber, as prepared for running the Rapids of the River St. Lawrence.

Galt Mechanics' Institute.

Machine Drawing.

Milton Mechanics' Institute.

Freehand Drawing.

Port Perry Mechanics' Institute.

Freehand Drawing.
Linear Perspective.
Practical Geometry.
Geometry and Perspective.
Mechanical Drawing.
Shading from the flat.

Whitby Mechanics' Institute.

Freehand Drawing-
Perspective.
Shading from the round.
Outline from the round.

Mechanics' Institutes and Branch Art Schools.

Reynolds' Chart of Condensing Steam Engine, Locomotive Engine, Oscillating Marine Engine, Marine Engine, Marine Paddle Engine, Marine Screw Engine, High Pressure Engine, Coal Mining, Cotton Plant and its Cultivation, Distilling, Electric Telegraph, Fire Engine, Flour Mill, Gas Metre, Hydraulic Press, Paper Machine, Printing Machine, Pumps, Mechanism of Clocks, Mechanism of Watch, Manufacture of Coal Gas.

Mabrun's Turbine Wheel.

Examples of Machine Details (set of 16). Department of Science and Art.

Sopwith's Surveying Diagrams.

PART III.

ART SCHOOLS.

Ontario School of Art, Toronto.

Freehand Drawing.
Drawing from Models.
Practical Geometry.
Linear Perspective.
Industrial Design.
Design for Paper Hanging—
Competitions for a Silver Medal, presented by the Ontario Manufacturers' Association.
Machine Drawing.
Architectural Drawing.
Shading from the Flat.
Charcoal from Life.
Shading from Antique.
Water Colors.
Oil Paintings.
Chasing in Brass.
Repoussé Work.
Sculpture in Marble.
Electro-metallurgy.
Modelling in Clay, and Plaster Casts from Clay.
Carving in Wood.

London Art School.

Specimens of Elementary Papers—
Grades, A. & B.
Machine Drawing, etc.
Industrial Designs (Original).
Shading from Casts.
Crayon Drawings from the flat.
Pen and Ink Drawing.
Oil Painting.
Water Colors.
Models in Clay and Plaster.
Models in Clay.
Plaster Models.
Paintings on China.

Ottawa Art School.

Specimens of Examination Papers in Grades A. & B.
Freehand Drawing.
Mechanics' Practical Geometry.
Practical Perspective Diagrams.
Mechanical Drawing.
Original Industrial Designs.
Industrial Designs—Competitions for Silver Medal offered by the Ontario Manufacturers' Association.
Shading from the "Round."
Life Studies.
Water Colors.
Oil Paintings.

Ottawa Normal School.

R. H. Whale.

Oil Painting, "Kirby Mill."

Kingston Art School.

Specimens of Examination Papers in Grades A. & B.
Perspective.
Architectural Drawing.
Mechanical Drawing.
Original Designs for Industrial uses.
Designs for Oil Cloth in Competition for a Silver Medal, presented by the Ontario Manufacturers' Association.
Shading from the "Flat."
Anatomical Figures.
Outline from the "Round."
Shading from the "Round."
Shading—Still Life.
Flower Drawing.
Water Colors.
Oil Paintings.

PART IV.

INSTITUTIONS FOR THE EDUCATION OF THE BLIND AND DEAF AND DUMB.

Ontario Institution for the Education of the Blind, Brantford.

Historical and Statistical.

Chart explaining the History and Statistics of the Institute.
Form of Application.
By-Laws.
Rules and Regulations.
Where it is, What it is, and What it does.
Annual Reports, 1882-3-4-5.

Photographs.

View of Buildings.
View of Buildings and grounds.
A Piano Lesson.
A Tuning Lesson.
A Knitting Class.
A Sewing Class.
Willow Work Shops.

Appliances for Teaching.

Reading and Writing.
Point Print Slate.
Embossed Book in Line Type.
Embossed Book in Point.
Embossed Book in Point Print.
Grooved Writing Cards.

Physiology and Natural History.

Cast of Human Leg.
Stuffed Pouched Gopher.
Stuffed Ground Hog.
Stuffed Prairie Hen.
Stuffed Grakle.
Stuffed Black Bass.

Willow Work Models.

Chair, Basket, etc.

Pupils' Work.

Reading and Writing.
Embossed Book transcribed in Point Print.
Specimens of Writing with Grooved Cards.
Willow Work.
Crochet Work.
Bead Work.
Machine and Hand Sewing.
Machine Knitted Goods.
Hand Knitting.

Ontario Institution for the Education of the Deaf and Dumb, Belleville.

Statistical Chart.

Photographs.

Deaf and Dumb Institute.
Deaf and Dumb Institute, with Pupils.
Boys Learning Shoemaking.
Football Club.
Pantomime Club.
Pantomime Club
Superintendent and Officers.
Superintendent's Residence.

Text-Books.

Readers.
Arithmetic.
History.
Geography.
Natural Philosophy.
Religious Instruction.

Pupils' Work.

Crayon Drawings.

PART V.

COLLEGES OF AGRICULTURE AND VETERINARY SCIENCE.

Ontario Agricultural College and Experimental Farm, Guelph, Ontario.

Geology.

Specimens illustrating the Geology of the Province of Ontario, used for teaching purposes.

Laurentian Series.
Huronian Series.
Cambrian Series.
Silurian Series.
Devonian Series.
Pleistocene.

Rocks which chiefly compose the Earth's Crust.
Minerals which constitute the majority of Rocks.
Animals which have influenced the Formation of Soil.

Mineralogical Collection.

Specimens used for purposes of reference in the Museum.
Native Elements.
Sulphides and Arsenides.
Chlorides and Fluorides.
Silicates.
Phosphates, Nitrates, Borates, and Tungstates.
Sulphates.
Carbonates.
Hydro-Carbons.

Botany.

Specimens illustrating Systematic and Economic Botany, used for teaching purposes.

Zoology.

Model of a Horse, showing internal structure.
Model of a Cow, showing internal structure.
Head of Devon Steer, fed at the farm, aged four years, weighed 1,960 lbs.
Head of Prince Albert Windsor Boar, purchased from Her Majesty the Queen, 1876, aged four years, weighed 410 lbs.
Collection of Insects injurious to Vegetation—1 to 11, Apple; 12 and 13, Pear; 14 to 17, Plum; 18 to 22, Cherry; 23 and 24, Cabbage; 25, Tomatoes; 20 to 32, Grape; 33, Currant; 34, Pea; 35, Potatoes.
Collection of Coleoptera.
" Hymenoptera.
" Lepidoptera.

Agricultural Seeds in Bottles.

Barley.	Beans.	Clover Seed.
Wheat.	Peas.	Millet.
Rye.	Timothy Seed.	Carrot Seed.
Oats.		

Chart showing history and progress of the Institution.
" plan of experimental field plots.
" plan of Farm.
" plan of Arboretum Planting, etc.
" Food in Cattle life, ten years at the farm.
" Milk per season, an estimate, 12 cows.
" Chemical analysis of Milk, 11 cows.
" Cream per cent., 11 cows.
" Butter Globules, result of 21 Microscopic observations at farm, 12 cows.
" Butter per 100 lbs., Milk and Cream, 11 cows.
" Cheese per 100 lbs., Milk and Cream, 11 cows.
" Farmers' Institutes held throughout the Province.
Photograph of Building.
Reports, etc.
Ontario Agricultural Commission, 1881, four vols.
Dairymen's Association.—Reports, etc.
Reports of the Fruit Growers' Association, and Entomological Society of Ontario, 1882.
Annual Reports of the Entomological Society, 1879-84.

Ontario Veterinary College, Toronto, Ontario.

Principal, A. Smith, V.S.

(In connection with the Agricultural and Art Association.)

Photographs.

View of College.
Dissecting Rooms.
Operating Room.
Operating Room with Students.
Portraits of 90 Senior Students, 1884-5.
Portraits of Senior Students and Professors, 1886.

PART VI.

SCIENTIFIC SOCIETIES, COMMERCIAL COLLEGES, Etc.

School of Practical Science, Toronto. Established 1877.

Photograph of Building.
Specimens of Drawing from the Department of Engineering.

1st Year.

Descriptive Geometry.
Orthographic Projection.
Surveys.
Graphics.
Machine Drawing.
Construction Copies.

2nd Year.

Descriptive Geometry.
Copies.
Practice Sheets.

3rd Year.

Descriptive Geometry.
Orthographic Projection.
Perspective Projection.
Stone Cutting.
Surveys.
Constructive Design.
Copies.

Institute Canadien Français, de la cité d'Ottawa.

Crayon Drawings.
Indian Ink and Pencil.
Mechanical Drawing.
Architectural and Masonry.
Linear Drawing.
Perspective.
Map Drawing.
Fancy Lettering.
Penmanship.

Meteorological Observatory, Toronto.—Photograph of Buildings.

Brockville Business College, Brockville, W. C. Austin, Principal.

Theory and Actual Business Department.
Test Books.
Students' Work.
Samples of the Money and Merchandise used by Students in the Actual Business Department of the College.

Canada Business College, Hamilton, R. E. Gallagher, Principal.

Business Penmanship.
Off-hand Flourishing.

Northern Business College, Owen Sound, Ontario, C. A. Fleming, Principal.

Specimens—Ornamental Penmanship.
Pen and Ink Sketch, showing how to obtain Practical Education.

PART VII.

UNIVERSITIES, COLLEGES, SCHOOLS OF MEDICINE, Etc.

Albert University, Belleville.—Photograph of Buildings.

Victoria University, Cobourg.—Photograph of Buildings.

Kosmos (V. P. Journal), published by the Science Association of the College.
Acta Victoriana, a Monthly Journal published by the Literary and Jackson Societies.

Toronto University, Toronto.—Photograph of Buildings.

University Trinity College, Toronto.—Photograph of Buildings.

Upper Canada College, Toronto.—Pupils' work. Photograph of Buildings.

Trinity College, Port Hope.—Photograph of Buildings.

Wycliffe College, Toronto.—View of Buildings.

Knox Presbyterian College, Toronto.—Photograph of Buildings.

Demill Ladies' College, Oshawa.—Painting of Buildings.

Alma Ladies' College, St. Thomas.

Pupils' Work.	Geometry.
Freehand from Flat Copy.	Shading from Antique.
Linear Perspective.	Outline from the Round.

Ontario Ladies' College, Whitby.

Photograph of Building.	Original Designs.
Pupils' Work.	Shading from the Flat.
Freehand Drawing.	Water Colors.

Brantford Ladies' College, Brantford.

Photograph of Building.	Pupils' Work, Oil Paintings.

Hamilton Ladies' College, Hamilton.

Photograph of Building.	Oil Paintings.
Pupils' Work.	

Woodstock Ladies' College, Woodstock.

Art Department.	Water Colors.
Pupils' Work.	Plain Crayons.
Oil Paintings.	Pastel Crayons.

Loretto Abbey, Toronto.

Photograph of Building.	Water Colors.
Pupils' Work.	Crayon Drawing.
Oil Paintings.	Embroidery.
Oil on Velvet.	Wax Work.

Loretto Convent, Hamilton.

Pupils' Work.	Modelling in Clay.
Oil Painting on China.	Satin Stitch and Applique Work.
Water Colors.	Honiton Lace.

Hellmuth Ladies' College, London.—Photograph of Buildings.

Sacred Heart Academy, London.—Lithograph of Buildings.

Loretto Convent, Niagara Falls.—Photograph of Buildings.

St. Joseph's Convent, Toronto.—Photograph of Buildings.

Convent of Notre Dame, Peterborough.—Photograph of Buildings.

SCHOOLS OF MEDICINE, ETC.

Toronto School of Medicine, Toronto.—Photograph of Buildings. Chart of Statistics.
Royal College of Physicians and Surgeons, Kingston.—Photograph of Building.
Ontario Pharmaceutical College, Toronto.—Photograph of Building.

OTHER INSTITUTIONS.

Osgoode Hall, Toronto.—Photographs of Buildings and Library.
De La Salle Institute, Toronto.—Photograph of Building.

In addition to the catalogue a large edition of a pamphlet relating to the Educational system of the Province of Ontario, showing its progress, was distributed at the Exhibition. It contained brief descriptive sketches of the working of the Educational Institutions in Ontario as follows:—

I.—ELEMENTARY SCHOOLS.

1. Kindergartens. 2. Public Schools, including Roman Catholic Separate Schools; with information on the Municipal system as applied to Schools; Public School Trustees and their duties; Public School Inspectors and their duties; County Boards of Examiners and their duties; the Central Committee and its functions; Teachers' Examinations; Certificates to Teachers; Religious Instruction in the Schools, etc.

II.—THE TRAINING OF TEACHERS.

1. County Model Schools, with course of study, etc. 2. Provincial, Normal and Model Schools, their object, course of instruction, etc. 3. Training Institutes, course of study, etc. 4. County Teachers' Institutes, formation and object. 5. Teachers' Reading Course, with list of books recommended, etc. 6. Ontario Teachers' Association.

III.—CLASSICAL SCHOOLS.

1. County High Schools, qualifications of masters, course of study, etc. 2. Collegiate Institutes, how formed. 3. Upper Canada College, Endowment, course of instruction, etc.

IV.—THE UNIVERSITIES.

1. University College, course of instruction, examination, etc. 2. The University of Toronto, its functions, etc.

V.—TECHNICAL SCHOOLS.

1. School of Practical Science, course of study, etc. 2. Ontario School of Art, course of instruction, etc. 3. Ontario Agricultural College and Experimental Farm, its object, department of instruction, etc.

VI.—SCHOOLS FOR SPECIAL CLASSES.

1. Ontario Institution for the Deaf and Dumb, its history and objects, course of instruction, etc. 2. Ontario Institution for the Education of the Blind, its history, etc.

VII.—INSTITUTIONS PARTLY AIDED BY GOVERNMENT.

1. The Canadian Institute, Toronto. 2. Institut Canadien, Ottawa. 3. Mechanics' Institutes, throughout the Province. 4. Ontario Society of Artists, Toronto. 5. Local

Art Schools, Toronto, Ottawa, Hamilton, Kingston and London. 6. Literary and Scientific Society, Ottawa. 7. Hamilton Association. 8. The Entomological Society of Ontario.

VIII.—UNIVERSITIES, COLLEGES, AND SCHOOLS NOT UNDER PROVINCIAL CONTROL.

1. Universities:—Victoria, at Cobourg; Queen's, at Kingston; Trinity College, at Toronto; Ottawa College; Western, at London. 2. Theological Colleges:—Knox, at Toronto (Presbyterian); Huron, at London (Church of England); Wycliffe, at Toronto (Church of England); McMaster Hall, at Toronto (Baptist); St. Michael's, at Toronto (Roman Catholic); Assumption, at Sandwich (Roman Catholic). 3. Classical and Literary Colleges, Etc.:—Albert College, at Belleville; Woodstock College; Trinity College School, at Port Hope; St. Michael's (in part), Toronto. 4. Ladies' Colleges:—Alexandra (department), at Belleville; Alma, at St. Thomas; Bishop Strachan School, at Toronto; Ladies' College, at Brantford; Hellmuth College, at London; Wesleyan Ladies' College, at Hamilton; Ontario Ladies' College, at Whitby; The Ladies' College, at Ottawa; Demill Ladies' College, at Oshawa; Ladies' College, Woodstock (department); Loretto Abbey, Toronto; Loretto Convents, at Hamilton, Lindsay and Niagara Falls; St. Joseph's Academy, Toronto. 5.—Medical Schools, Etc.:—The College of Physicians and Surgeons of Ontario; Toronto School of Medicine; Trinity Medical School, Toronto; Royal College of Physicians and Surgeons, Toronto; College of Pharmacy, Toronto; School of Dentistry of the Royal College of Dental Surgeons, Toronto; Women's Medical Colleges, Kingston and Toronto; Ontario Veterinary College, Toronto. 6. Business Colleges:—At Belleville, 1; Brockville, 1; Chatham, 1; Guelph, 1; Hamilton, 2; Kingston, 1; London, 1; Peterboro', 1; Toronto, 2; Owen Sound, 1.

IX.—MISCELLANEOUS INSTITUTIONS.

1. The Magnetic and Meteorological Observatory, Toronto. 2. Royal Military College, Kingston. 3. The Law Society of Upper Canada. 4. Public Libraries in Ontario.

X.—BENEVOLENT EDUCATIONAL INSTITUTIONS.

1. Shingwauk Home for Indian Boys.
2. Wawanosh Home for Indian Girls, Sault Ste. Marie.

XI.—BENEVOLENT EDUCATIONAL HOMES AND REFORMATORIES.

1. The Boys' Home, Toronto. 2. The Girls' Home, Toronto. 3. The Orphans' Home, Toronto. 4. Industrial School, Toronto. 5. Industrial Refuge for Girls, Toronto. 6. Ontario Reformatory for Boys.

In accordance with your instructions I got 500 copies each of the pamphlet and catalogue bound together in cloth for distribution to H. M. School Inspectors, Clerks of School Boards, etc., throughout the United Kingdom. A copy of the following circular was sent with each book :—

Colonial and Indian Exhibition, 10th July, 1886.

Dear Sir,—I am directed by the Honorable the Minister of Education to send herewith a pamphlet respecting the educational system of the Province of Ontario, Canada, and a catalogue of Exhibits of School Material, Pupils' Work, etc., at the Colonial and Indian Exhibition.

I shall be pleased to meet any of H. M. Inspectors of Schools, Teachers, and Educationists, by appointment; or give any information respecting our Exhibit, or School System, by correspondence.

Yours truly,

S. P. MAY.

Nearly every person to whom the circular was sent acknowledged its receipt, and many of them made appointments to visit the Exhibition during the holidays ; amongst others, letters were received from the Education Department, Whitehall ; H. M. School Inspectors, London, and School Boards in Acton, Ashford, Ariedale, Birmingham, Cambridge, Chelsea, Exeter, Edinburgh, Friston, Guildford, Harrow, Hull, Ipswich, Kent, Liverpool, Manchester, Nottingham, Newcastle, Norwich, Oxford, Richmond, Rochdale, Salford, Wokingham, etc.

The following extracts show that the press took an interest in this scheme. The *Globe* says :—

"The remarkable educational exhibit, which has been sent to South Kensington under the auspices of the Ontario Government, continues to attract the attention it merits from all classes of visitors. Already it has been examined in detail by many educationists, a large number of whom will, however, be freer to spend time in the Court when the summer vacation begins. To bring the exhibit before the notice of these gentlemen, Dr. May has taken a wise step. To official school inspectors, to the principals of the leading schools and colleges, and to clerks of school boards and other similar authorities—numbering in all several hundreds—he has sent a neatly bound volume containing a description of Ontario's Educational System, and a Catalogue of the Exhibits. With this volume, which is 'presented on behalf of the Education Department of Ontario, by the Hon. G. W. Ross and Dr. S. Passmore May,' a special invitation to visit the Court is also forwarded, and an intimation is given that Dr. May will be most happy to furnish personally to such visitors all the information in his power. The invitation will, doubtlessly, be gladly accepted by many of the best-known members of the scholastic profession, and by this means much useful information will be disseminated respecting Ontario's enterprise in a matter which is so closely related to the real welfare of the province."

The *Schoolmaster* remarks :—

"Dr. May will be happy to give every explanation which may be desired for educationists who are anxious to make a personal study of the results as they are displayed in South Kensington ; and, if parties of visitors will communicate with him personally, he will be happy to arrange for a collective guidance and descriptive sketch."

As many of the inspectors and representatives of school boards notified the teachers in their respective districts, that the educational point would be of interest to them during the holidays, a large number of teachers and others concerned in education, accepted my invitation, and I am proud to say that many of them acknowledged the superiority of our educational system, and all of them seemed surprised at the extent and excellence of our exhibit.

Extract from *Press* :—

"The vacation, which is now drawing to a close, has enabled a large number of leading educationists to pay a visit to the Ontario Educational Court. In response to the circular issued by Dr. May, numerous replies have been received from all parts of the United Kingdom, and appointments been made with many leading members of the profession, for a careful examination of Ontario's exhibit. Without an exception, these experts have all pronounced themselves as much pleased and surprised at the evidence afforded of Ontario's educational progress, and especially with the excellent display of appliances for teaching, and the character of the specimens of work done by the pupils."

OPINIONS OF THE BRITISH PRESS ON THE EDUCATIONAL EXHIBITS OF ONTARIO.

As it would occupy too much space to insert all the lengthy articles referring to our exhibits by the press, I shall confine myself to extracts from them, giving first a few of the notices relating to the general, and afterwards those which refer to special exhibits, in the order of classification in the catalogue.

In a series of articles on the Canadian section of the Exhibition, the *Times* notices the educational exhibit of the Dominion. The writer remarks :—

"Canada has already produced a very creditable national literature, notably in History and Science. As the section devoted to education and instruction shows, Canada has an excellent

system of national education. The Ontario Section has been admirably arranged by Dr. Passmore May, the Commissioner in charge of the education exhibits of that province, and would require an article to itself to do it justice. There is much historical and statistical material showing the progress and present condition of education ; exhibits illustrative of school methods and organization ; a fair show of photographs of schools, colleges, etc.; school furniture and fittings, some of them highly ingenious ; text books of all kinds ; apparatus used in teaching anatomy and physiology, physics, chemistry, and other subjects; with abundant specimens of pupils' work in all departments. Then we have exhibits from mechanics' institutes, art schools, institutes for deaf, dumb, and blind, agricultural and other special colleges, universities and the higher institutions. All these are shown and exhibited by the Ontario Government."

In a subsequent article the writer observes :—

"The educational exhibits of Canada deserve more detailed notice than we were able to accord them in our previous articles. In none of the courts is this department of colonial activity so fully represented. As we have already said, the Educational Department of Ontario, under the care of Dr. May, is more fully represented than is the case with any of the other provincial governments. The Ontario educational system has been in working order for many years, and is very completely organized, from the Kindergarten and public elementary schools up through the various training schools for teachers, classical schools, universities, technical schools, special schools, medical and other independent schools, and scientific and literary institutions. All these classes of institutions are well represented in the Ontario Court. In the gallery there are abundant exhibits, showing the working and results of the Kindergarten and elementary schools. In the former the training seems well adapted to educate the eye and the fingers of the little ones, as well as to draw out their budding minds. The specimens of art work, of maps, and exercises of various kinds from the elementary schools would come out well if placed alongside any similar specimens from the schools of this country. The art schools, especially, appear to be doing excellent work, as anyone may see for himself by inspecting the many sketches and models which are exhibited in the Court. The systems in vogue in the institutions for the deaf and dumb, and for the blind, seem particularly well adapted to their purpose ; and the statistics of these institutions on the central screens, as well as the specimens of work and illustrations of method and apparatus in the gallery, are well worth inspecting by those interested in this special department of education. Evidently very great care is bestowed on the training of teachers for the various classes of schools in Ontario. The examinations which they have to undergo are formidable and comprehensive, and for the higher grades quite as formidable as that of the London B. A., and far more varied. Science holds a prominent place in the educational system of Ontario, and the specimens of apparatus in all departments—physics, chemistry, biology—for teaching it are among the prominent exhibits of the Court. The Ontario Agricultural College, established in 1874, is largely represented among the exhibits ; and from them, as well as from the published reports and results, it is evident that the institution affords an admirable training, which must have a highly beneficial influence on the agricultural development of the Dominion. These are only a few of the more evident features of this interesting Court. We must refer those desiring further details to the volume on the 'Educational System of the Province of Ontario," published in connection with the Exhibition.

"Altogether, education in Canada is in a healthy and hopeful condition. There are probably too many degree-granting bodies ; degrees would be much more valuable if they were granted solely by one central university for each province."

The *Schoolmaster*, in a series of articles on the Schools of Greater Britain, describes at length the educational system of Ontario. The following extract is from one of its first articles :—

"In dealing with the educational details of the Dominion, we turn to Ontario, as a matter of course, in the first place. It is in every way the most important section, and on the present occasion is represented with a completeness which befits the occasion. Its Education Department, under the direction of the Hon. Geo. W. Ross, LL.B., M.P.P., Minister of Education, controls the Provincial Normal and Model Schools; County Model Schools ; Public, Separate and High Schools, and Collegiate Institutes ; also, Upper Canada College, School of Practical Science, University College, Toronto University, Educational Museum, and Art Schools, Mechanics' Institutes, and other institutions receiving Government aid for educational purposes in the Province of Ontario. The fruits of these educational institutions are summarized and illustrated in an excellent display, which has been prepared under the supervision of Dr. S. Passmore May, the Superintendent of Mechanics Institutes and Art Schools.

To the Hon. Mr. Ross and to Dr. May alike, we have to return our sincere thanks for the voluminous information which has been placed at our disposal, and for the personal courtesy which has been displayed at our interviews in the educational section."

The *Morning Post*, in an interesting article on Canada, says:—

"A very remarkable and deeply interesting exhibit is made by the Education Department of the Province of Ontario, Canada, which is arranged in the space between the Canadian Exhibits and the section devoted to New Zealand. Since 1807, when the first legislative enactment was passed, establishing a classical and mathematical school in each of the eight districts in which Upper Canada was then divided, great progress has been made. Year by year the work of educational advancement has been steadily going on, the greatest forward stride being in 1844, when the appointment of the Rev. E. Ryerson, D.D., to the office of Chief Superintendent of Education, gave a great impetus to public education. This gentleman set to work to reconstruct, upon a broader and more comprehensive basis, the system of elementary schools. That now in use may be said to be a combination of the best elements of the systems of several countries—notably, the United States and Germany. All are, however, so blended together and modified that they are no longer foreign, but incorporated as part and parcel of the system of public instruction in Ontario. Dr. Samuel Passmore May, Superintendent of the Mechanics' Institutes and Art Schools, has arranged the display in a manner which reflects greatly upon his judgment and organizing power. The Court is decorated in an artistic manner, and embellished with busts of leading citizens who have devoted themselves in an especial manner to the advancement of education. The Kindergarten system has evidently taken deep root in Canada, and the exhibits are worthy of the attention of those who are interested in this admirable method of facilitating study for children in this country. The fine arts have not been neglected, and there are models, paintings, drawings from the life, casts in bronze, wood carvings, paintings on porcelain, and a variety of other interesting proofs of the zeal which is exercised in Toronto, as elsewhere in Canada, in all that concerns artistic training. Some of the paintings show considerable talent, but the wood-carvings and bronze work are exceptionally excellent. One cannot help thinking when examining the work here displayed, that the importation of a few well-trained Italian teachers of drawing, past masters in the art, such as are to be found in Rome or Florence, and who would willingly emigrate, would prove of inestimable advantage to the young Canadians, who have evidently talent, but which has not always been well developed, possibly from a lack of proper direction. But in all that concerns science and agriculture, no fault can be found. The collection of geological specimens used for teaching purposes are capital, and the photographs for instruction in anatomy are remarkably ingenious, notably so, those which have the veterinary science for their object. The Albert University, Belleville, sends some capital photographs, and the Victoria University several publications of a literary character, which prove that the pupils take interest in all that is of importance in ancient and modern art and history. The Roman Catholic ladies' colleges, which are numerous throughout Canada, excel in the beauty of their laces and embroideries, and evidently devote much attention to the arts of painting on silk and the reproduction of every kind of lace. A good hour could well be passed in this section by all who take interest in educational matters, and those who do so should not fail to pay a visit to Dr. May, and obtain direct from him information, which he is always glad to impart as well as to receive, it being his great object, whilst in England, to obtain from all sources ideas and views calculated to practically improve the educational system of his adopted country."

The following extracts are from the *Canadian Gazette*:—

"THE ONTARIO EDUCATIONAL COURT.

'Education is the glory of Canada.' This is the motto placed above the entry to the Canadian educational exhibits, and no visitor can inspect these exhibits without feeling that the motto is far from a mere idle boast. Everyone knows how important a part education plays in the public life of the Dominion, and in no Province is this more the case than in Ontario.

Ontario's system of public instruction is indeed remarkable, as a combination of the best elements of the systems of several countries. From New York some leading ideas as to the machinery of the schools have been obtained; from Germany the system of Normal School training; from Ireland originally came the principle upon which the series of text-books is based; and from Massachusetts the system of local taxation upon which the schools are supported. Thus, gathering here a little and there a little, Ontario has succeeded in building up a system which, combining what is best in the leading methods of the old and new worlds, is admirably suited to the exact needs of the country. What those needs are it is hardly necessary to enquire on the face of the industrial development shown in almost every part of the Canadian Section at South Kensington."

"The Ontario Educational Court is itself excellently representative of the advanced position assumed by education in the Province, and its inspection cannot be better undertaken than in company with the excellent descriptive catalogue to the exhibits which Dr. May has been at no little trouble to prepare."

"The whole exhibit is one of the greatest interest, and, let it be added, of the greatest educational value in Great Britain, where many important lessons may be learnt from the excellent system which Ontario has taken such pains to perfect. Ontario, too, may find food for satisfaction; for if, as Jules Simon somewhere tells us, the people that maintains the best organized schools is the greatest people of the world—if not to-day, at least to-morrow—the Province has every reason to regard its future with great hope. It should be added, that under Dr S. P. May, as Commissioner of Education at the Exhibition, and Superintendent of the Art Schools and Mechanics' Institutes of Ontario, the various exhibits have been arranged with every regard to their relative importance and the frequent necessity for speedy reference. It may also be mentioned that the Hon. George W. Ross, Minister of Education for Ontario, personally interested himself in the display here and in Canada, and while in England was made an Honorary Commissioner of the Canadian Section."

The *Christian World* says:—

"The Province of Ontario has taken advantage of the Colonial and Indian Exhibition to call attention to its educational system, of which it is justly proud. A complete collection of school appliances, pupils' work, etc, prepared under the direction of the Minister of Education, is exhibited. A catalogue of this collection, prefaced by an exhaustive descriptive and statistical account of the past progress and present position of education in the province, may be obtained by anyone interested in the work from Dr. Passmore May, the Commissioner in charge. The population of Ontario is now a little short of two millions, and in forty years the children of school age have increased from 183,539 to 471,287. The number of schools has increased from 2,610 to 5,316, with a present annual expenditure of between three and four million dollars. There are five universities or colleges not under provincial control; nineteen classical and literary colleges; eight medical colleges, including two for women; and six theological colleges, belonging to the Churches of England and Scotland, the Roman Catholics, and the Baptists. There are various other miscellaneous professional institutions. The Sunday-schools are 3,600 in number, with 200,000 scholars, taught by 23,000 teachers. The Province has incorporated what seemed to it the best features in the educational systems of the States, Germany, and our own country. It evidently holds firm to the belief that knowledge is power. The progress made is marvellous considering the difficulties that have had to be encountered and overcome."

The *South London Press* in an article on Education at the Exhibition says:—

"A brief study of the great Intercolonial Show at South Kensington will convince the inquirer of the progress education is making in our Colonies. In each of the courts there are photographs of school houses, colleges, and universities, as well as statistics of the number of children under instruction, the amount of money annually spent on schools, and other such information. Canada has, however, the best educational display in the Exhibition, and judging by its size and completeness, the great Transatlantic British dependency is intellectually more than keeping pace with the times. This is the most enlightened age of the world's history, and all civilized countries are now competing in the efficiency of their systems of education, genera and technical, as it is well uderstood by their statesmen and political economists that education is the most powerful lever for the social elevation of the masses, and the surest foundation for the stability of the State. This fact would seem to be fully recognized by the Government and people of Ontario, or, as it was formerly called, Upper Canada—the wealthiest, and most influential province in the Confederation. Her educational display at South Kensington is very fine, and while that of the Dominion is the largest in the Exhibition, that of Ontario is the best and most important of all the Canadian provinces. On the walls there are numerous photographs of the educational establishments, many of which would seem to be buildings of considerable architectural merit, such as the University of Toronto, St. Michael's College, Toronto, Trinity College, Toronto, the Catholic Convent at Niagara Falls, and many other institutions for the instruction of youth. There are also some excellent drawings by pupils of the Art Classes connected with the Mechanics' Institutes, all of which receive a grant in aid from the provincial Government, of which education is a department, under a responsible Minister, who has recently made a tour in Europe to see what improvement he could effect in the Ontario school system. The display, which was in charge of Dr. May, who is an experienced educationist, does the Province honour, and is a strong evidence of her intellectual energy, as well as of cohesion and unity of action among her people."

A special report for the *Colonial Exhibition Supplement* on the Ontario Educational Exhibit was prepared by Mr. H. Courthorpe Bowen, M.A., Principal of the Finsbury Training College for middle and higher schools, from which I here give extracts, and shall

give others under the different classes as extracts from Mr. Bowen's report. In his introductory remarks, Mr. Bowen says :—

"Through the kindness of Dr. May I have been able to make a tolerably minute examination of the educational work arranged by him, and now to be seen in the Ontario division of the Canadian Court of the Colonial and Indian Exhibition. I propose to state as concisely as possible, the general impressions which that examination has left upon my mind. Let me say at once that I have been much struck by the completeness and comprehensiveness of the exhibit as a whole, and by the generally satisfactory character of the work shown—work which is the result of an educational system of which Ontario is very justly proud. As far as completeness and soundness of organization are concerned, we have nothing in the old country to be compared with the system of Ontario. In England organization ceases with the elementary—or as a Canadian would call them, the 'public'—schools. Above this, the lowest grade, English education is entirely unorganized. This state of things, no doubt, has its advantages ; but it has one very great disadvantage, against which Ontario has most wisely protected itself. In English schools, above the lowest grade, anyone can assume the office of teacher without having satisfied any tests that he or she is fitted to teach or to manage school-classes ; while, strange to say, our inspectors of schools, with only a few though very striking exceptions, are the most amateur of all, and have not, as a rule, ever been schoolmasters. Even amongst our elementary teachers' training, properly so-called, is by no means universal, and what there is of it is in many respects decidedly unsatisfactory. In Ontario, however, as far as I can judge from the printed regulations, both the system of training adopted and the course of study prescribed, seem to me very distinctly good ; though I think that more importance should be attached to the regular study of Psychology, and that every teacher should be required, even for the third-class certificate, to master as much of the subject as is contained in such a book as Mr. Sully's smaller one *'The Teacher's Handbook of Psychology,' while as to the results of the system, as shown in the work of the pupils of the Public and High Schools of Ontario, I can honestly say that, taken as a whole, it is already, in my opinion, quite equal, and in some respects superior, to the average work of our Elementary, Middle, and Grammar Schools in England. And, moreover, the work of the Collegiate Institutes, except perhaps in the department of classics, would not suffer much by being compared with that of our great public schools.

For details of Mr. Bowen's report see notice of the different classes of exhibits.

Extract from a lengthy article in the *Clerkenwell Chronicle* :—

"The Ontario Court is situated at the end of the Machinery in Motion Section, and between it and the New Zealand Court, and occupying about 3,000 feet of space, the exhibits being in charge of Dr. May, an experienced educationist. At South Kensington this gentleman never loses an opportunity of directing public attention to his exhibits, and to that end has published an exceedingly interesting handbook, which he judiciously distributes to those interested in school matters. In the centre of the court are charts which show at a glance the educational work of the last few years and the basis upon which the system is established. In elegant glass cases are numerous models for the use of pupils, more especially those of the Normal Schools and Art Classes, many of them being connected with the Mechanics' Institutes, of which there are in Ontario a great number scattered up and down the country, the pupils of those classes being eligible for certificates of competency from the Education Department of the Provincial Government. Toronto, the capital of Ontario, is an archiepiscopal see of the Roman Catholic Church, and the people of that communion have separate schools, or, as they are called in this country, denominational schools, and judging of them from the display at the Collinderies, many of them are large and handsome buildings, to which in the arrangement in his collection of photographs Dr. May has given advantageous positions, a rather pleasant feature, inasmuch as it shows a spirit of impartiality to Catholics and Protestants alike Without going into the minute details of this excellent exhibit of the educational progress made during the last few years in the large and flourishing Province of Ontario, we may, however, generalize by saying that it is a striking evidence of the push and energy of her people and Government. The fine collection of photographs, models, drawings, scientific instruments school furniture, maps, globes, needlework, carving in wood, metallurgical designs, and class-books, are powerful witnesses of her rapid strides towards that higher civilization always brought into existence by refinement and education."

* I subsequently directed Mr. Bowen's attention to the fact that Sully's Psychology and Jardine's Psychology of Cognition are on the list of books recommended for teachers.

I shall now refer to the different classes of exhibits as classified in the catalogue:—

PART I.

NORMAL AND MODEL SCHOOLS, PUBLIC AND HIGH SCHOOLS AND COLLEGIATE INSTITUTES.

Class 1.—Historical and Statistical.

This Class consisted of Educational Reports, Statistics, etc. The principal feature was an educational trophy, which was placed in the centre of the Court. It consisted of twelve large charts, showing the progress and statistics of Educational Institutions under control of the Education Department, and Educational Institutions assisted by the Government of this Province These were mounted on a dodecahedron or twelve-faced prism, with mirrors between the frames. On the top of each frame was a large photograph of the institution referred to in each chart. In the centre of the charts, and surmounting the prism, was a semi-circular support for a 36-inch globe, so colored and placed in position as to show the immense extent of territory in the Dominion of Canada.

This trophy was a great attraction, the excellent photographs of some of our principal educational buildings were much admired, and the statistics on the charts were so clearly indicated that persons could see at a glance the immense educational progress we have made in this Province during the past forty years.

In addition to the trophy, we had a large map of Ontario, specially prepared to show the number of public schools, high schools, colleges, ladies' colleges, universities, etc., in each county.

Class 2.—School Methods and Organization.

In this Class were books on school methods, education, hygiene, etc. The following notices refer to some of the books:

The *Schoolmaster* has the following review of the Manual of Hygiene for Schools and Colleges (Toronto, W. Briggs):—

"Prepared by the Provincial Board of Health, and authorized by the Minister of Education, for use in all schools under the control of the Education Department of Ontario, this work, while presenting nothing of originality in conception or treatment, appears to be a very fair compilation from acknowledged text-books and authorities on both sides of the Atlantic. A good table of contents precedes, and an index follows the text; while speedy reference is much facilitated by printing the first words of each paragraph, which are so contrived as to give a clue to what follows, in condensed type. The references in the index, too, are to paragraphs, not pages. There is the usual amount of elementary physiology; which, however, we would rather were omitted, and taught, as our syllabus requires, previously from special text-books. Among the statistics adduced in proof of the influence of sanitary improvements on the health of towns, the most remarkable are those showing the reduction of the mortality from typhoid in Munich, from 242 to 17 per 100,000, step by step with the introduction of better methods of sewerage. We should, however, have liked to see more attention called to the fallacies incident to the inconsiderate use of statistics. There are some interesting remarks on the feasibility of sewage irrigation, even when the ground is frozen hard and covered with snow. Mr. W. Briggs' (not the publisher's) experiments with smoke in demonstrating the movements of the air in rooms, with the inlets and outlets in different positions, are most interesting, and, should they be verified, cannot fail to be of the utmost practical importance. He found a complete change of the air in every part of the room only when the outlet was at the level of the floor and the inlet high on the same side. The chapters on school hygiene are especially good, and the work, as a whole—covering a somewhat wider field than our elementary and advanced, but a narrower than our honors syllabus—is one which we can heartily recommend. We cannot but think, however, that the introduction of a few mathematical formulæ in the chapters on ventilation and sewerage would be an improvement.

Public School History of England and Canada. By G. M. Adam and W. J. Roberts, Toronto : The Copp Clark Company.

"We felt, after reading the preface of this book, that we should find a short history, but very well compiled and written, and we were not disappointed. The hints to teachers, though somewhat out of place, are excellent in their way, and there is a careful list of authors recommended. We are surprised, however, that this list omits Mrs. Rawson Gardener's name."

The Rev. C. H. Spurgeon, in the *Sword and Trowel*, refers to the "Scripture Readings for High and Public Schools" as follows :—

"Our Ontario friends have selected these readings from Scripture, for use in the schools of the Province, and the selection has been judiciously made. Without violation of religious liberty, the Bible is thus read in the public schools ; and why not ? What is education without religion and morality ? Where can these be so well learned as from the sacred Word ?"

The *Christian World*, in a special notice, says :—

"We have received a copy of 'Scripture Readings for High and Public Schools,' published by the Education Department, Ontario. The readings have been carefully selected and arranged by the representatives of all denominations. The volume appears very suitable for the purpose in view. The readings are classified as historical, devotional, didactic, prophetic, and moral ; the Gospels ; the Acts of the Apostles ; and Selections from the Epistles. The whole of the Bible is thus laid under contribution, and the young folk, for whose benefit the book is designed, should obtain from it an intelligible idea of the main facts of sacred history and teaching, without the glosses put upon it by sectarian explanations. In the preface, teachers are exhorted to due reverence, decorum, and earnestness, while the Scripture exercises are in progress, and are enjoined to lose no opportunity of inculcating the principles of truth and honesty, and obedience to those to whom it is due."

The *Christian Herald and Signs of the Times* also remarks :—

"A volume of 'Scripture Readings for High and Public Schools' has been prepared under the direction of the Education Department of Canada, which contains a course of lessons so arranged as to include the most instructive portion of both the Old and New Testaments. Dr. May, of the Canadian Education Department, Colonial and Indian Exhibition, South Kensington, London, will answer any inquiries which may be addressed to him upon the subject."

Class 3.—School Architecture and Photographs of School Buildings.

These large photographs were mounted in handsome black walnut frames, and displayed in front of the galleries.

The following extract is from the *Clerkenwell Chronicle* :—

"There are in the Exhibition numerous examples of the educational development of the colonies, but the largest and most important is that of Ontario, or, as it was formerly called, Upper Canada. This fine display of School appliances and pupils' work marks the extraordinary march of education in the Province alluded to, which all authorities agree as being a portion of the Dominion that has, during the last twenty years, made rapid strides in the paths of industrial and commercial progress. On the walls of the Ontario Educational Court are large photographs of the different scholastic institutions. Elementary Schools, Normal Schools, Model Schools, Art Schools, Mechanics' Institutes, Colleges, Convents, Seminaries, the University of Ontario, and other establishments for the education and improvement of the young man and womanhood of Ontario. Photography is one of the triumphs of modern science and ingenuity. It may be fairly considered a branch of modern education, inasmuch as it portrays and easily makes clear to the understanding scenes and places which could not be so well done by any amount of descriptive writing ; and placing in the Exhibition pictures of their educational establishments, the Ontario Government has acted wisely and well.

Everywhere in Canada the school-houses are, generally speaking, the largest and most conspicuous buildings in the villages and small towns, and this applies specially in the rich and fertile Province of Ontario, that directly and indirectly taxes itself rather heavily for the purposes of education, which is a department of the Provincial Government under the control of a respon-

sible Minister. The people recognize the necessity and value of education in the promotion of industries and manufactures, as well as in the development of their country's many natural resources. On reflection, however, there is nothing very wonderful in the colonies endeavoring to make education as general and as practical as possible, because, as a rule, it is only men of natural enterprise and energy who emigrate, and it is, therefore, entirely in accordance with the law of progress that they shall, in the new countries of their choice, establish the most liberal and useful system of education they can devise. A man may be illiterate, but endowed by nature with large-heartedness and force of character, and such a man, by his vote and his money, will determine that his country and his children shall, intellectually, be superior to himself. This is in reality the secret of the great desire in the colonies to keep pace with the times in educational matters."

Class 4.—School Furniture and Fittings.

School desks and seats were exhibited in the Educational Court by the Bennet Furnishing Company, London, and W. Stahlschmidt & Co., Preston. They were distributed throughout the Court in such a manner that, without obstructing the passages, the seats might be used by persons examining the exhibits. As over 5,000,000 persons visited the Exhibition, it is a safe computation to say that over 500,000 persons used these seats during the Exhibition, and it is gratifying to state, that at the close they were apparently in as good condition as when first screwed to the floor.

The Bennet Furnishing Company have established manufactories in England and Scotland, and have fitted up several large schools with Canadian desks and seats. Messrs. Stahlschmidt & Co. have opened up an agency in London.

The *Globe*, referring to the excellence of the school desks in the Ontario Educational Court, says:—

"Unfortunately, in this country, sufficient attention has not been directed by schoolmasters to the importance of providing desks and seats adapted to the requirements of children. We are told by persons in authority, that the death-rate of children is diminishing, in consequence of improvement in sanitary surroundings. We do not hesitate to say that the death-rate would diminish in a much greater proportion if proper school-desks and seats were provided for them."

Class 5.—Kindergarten Material.

Specimens of Kindergarten Furniture were exhibited by Selby & Co., Toronto. The smaller chairs, painted to represent the primary colors, were a novelty, and there were numerous applications for their purchase.

Class 6.—Physical Education.

A large gymnasium was exhibited by the Department, but for want of sufficient room in the Educational Court, it had to be set up in the quadrant leading to the Albert Hall.

Class 7.—Text Books.

A large book-case, placed near the entrance to my office, contained samples of all the text books authorized for use in Public Schools, High Schools, and Collegiate Institutes.

The following notice of the New Canadian Readers, authorized by the Minister of Education, is from the *Schoolmaster*:—

"*The Ontario Readers.* First Reader (parts 1 and 2), and Second, Third and Fourth Readers. Toronto: Copp, Clark & Co.

These Ontario Readers are authorized by the Canadian Minister of Education for use in the public schools, and are fine specimens of what a set of reading books should combine. They

begin with the elements in Part 1 of the First Reader, and gradually go on through the simplest primary exercises, until, in No. 4, we have selections from authors who stand in the front rank of English literature. High-class pictorial illustrations are a considerable feature in both parts of the First Reader, and materially assist teacher and scholar in surmounting the difficulties in the early stages. The Second Reader is adapted for a good second standard, the Third Reader for the next two standards, and the Fourth Book would suit the upper-classes in any school. It is a veritable storehouse of gems of modern English, and is as interesting to the adult and junior students in the mother country as we hope it proves to the adult and scholar in the great Canadian Dominion over the wide Atlantic. The prefaces and explanatory pages to each book are excellent accompaniments to the set. Such books are an honor to any country. If children are to be taught reading in a logical manner, and to have their intelligence developed on rational lines, and withal to receive encouragement in their daily tasks, books like the Ontario Readers must be successful in producing such results, or they can never be done at all."

Canadian Drawing Books. The following letters are from the most prominent and experienced teachers of drawing in the United Kingdom :—

Copy of letter from Miss Gann, Superintendent of the Female School of Art, under the patronage of the Queen, 43 Queen Square, Bloomsbury.

November 8th, 1886.

Dear Sir.—The five little books, "The Canadian Drawing Course," which you have been good enough to send me, as being specially designed for pupils in schools when trained teachers in drawing are yet unattainable, I think excellent for the purpose.

I might suggest, if you publish a further course, that it would be interesting, and would make a variety always desirable in teaching the young, if you could make use of other leaves and treat them as you have done the horse chestnut in Book 2.

Miss Wilson and myself were much pleased with our visit to the Educational Department of Canada in the Colonial and Industrial Exhibition, which you made so interesting by your explanations.

We considered the Elementary work exceedingly good and the designs especially so. I wish we could have specified some of the works which pleased us most, but unfortunately we did not take any notes at the time.

I have, etc.,

LOUISA GANN.

Copy of letter from Mr. J. Sparks, Superintendent, National Art Training School, South Kensington.

November 3rd, 1886.

Dear Dr. May,—I have to thank you for the valuable and interesting books you were good enough to send over to me.

The drawing books are good and carefully edited, but I am still of opinion that the Belgian system, which deals with drawing from the first, when children are five years old, has much to recommend it over drawing on paper, especially as, in this country at least, "cramming" for the Government paper is about all that is thought of in the freehand classes.

I am quite sure blackboard teaching to classes is the best means of developing children's thinking powers.

I remain, etc.,

J. SPARKS.

Mr. Sparks' opinion perfectly coincides with that of this Department. We are endeavoring to make blackboard teaching in drawing most prominent in all our educational institutions, and it is generally adopted in the Art schools, but, as subsequently explained to Mr. Sparks, drawing is comparatively a new subject in our public schools, and as the majority of our teachers have had no experience in this direction, the new series of drawing books are specially prepared to assist the teachers as well as pupils.

Extract from Mr. Bowen's report :

"*Drawing.*—By the kindness of Dr. May, I have been able to examine carefully the fine drawing-books of the 'Canadian Drawing Course,' and from the point of view of one fond of Art and a teacher keenly interested in Art teaching, I must pronounce them to be very good indeed. There are, however, one or two points with regard to them which I should like to put forward

for reconsideration. If the size of the books is intended to indicate the size of the pupil's drawings, then I cannot but think them far—at least four times—too small. *The hand cannot be free* when the work measures no more than two or three inches in its greatest length ; while not only the hand, but the wrist often, and even the elbow sometimes, should be given free movement. The elaborate pictures of men and animals in some of the books sent in by these same schools were, I am sorry to say, in my opinion wholly unsatisfactory, and likely to do harm rather than good. On the other hand, there were some drawings of flowers (from nature) from the Ontario Art Schools, which were very good. So, too, the Model drawings from most of the High Schools and Collegiate Institutes were very satisfactory in regard to correctness and neatness, while these same Schools and the Mechanics' Institutes exhibited satisfactory, and in some cases excellent, specimens of geometrical drawing."

Mr. Bowen's objection as to the size of drawings is removed by the previous statement that these drawings are copied on the background by the pupils.

We perfectly agree with Mr. Bowen in regard to the pictures of men and animals. They are of no practical value, but as they were sent from schools which had scarcely commenced work in accordance with the new system of industrial drawing now made compulsory, it was considered advisable to exhibit them so as to compare the value of former school work with that of the present time.

Class 8.—Reading Charts, Etc.

The illustrated Reading Lessons exhibited by Messrs. Copp, Clark & Co., to accompany the First Readers, attracted much attention ; the clearness of type and excellence of drawing was much commented upon, and numerous applications were made for the purchase of the Tablet Reading Lessons displayed.

In this class, too, was a set of Tabulated Phonetic Alphabet Charts by Mr. Caleb P. Simpson, Leamington. These were of great interest to teachers, and especially those who had made a study of Phonotypy.

Class 9.—Drawing Models.

In this class were some excellent Drawing Models of common objects, also sets of Primary Canadian and Geometrical Models adapted to the Canadian Drawing Books, exhibited by Messrs. Selby & Co., Toronto.

Class 10.—Music.

Messrs. R. S Williams & Son exhibited a Public School Cabinet Organ, and Public and High School Piano in this class. As their instruments were frequently played upon by an expert during the exhibition, visitors had an opportunity of judging of the quality of tone, power, etc. Although the Public School organ is so light that it can be carried by a child from room to room, it is sufficiently powerful for large school rooms or outdoor exercises.

The Canadian School Publishing Co., Toronto, also exhibited Music Charts and Books in this class, and I am informed that they have already received orders from England for the Normal Music Charts.

Class 11.—Geography and Astronomy.

In this class we had a large display of topographical illustrations consisting of Terrestrial, Raised, and Physical Globes, and a collection of School Maps and a Map Case with patent springs exhibited by the Map and School Supply Co., Toronto ; also Astronomical Illustrations, embracing Celestial Globes, Drawings, Astronomical and Physical Maps and Charts, etc., and a Newtonian or Astronomical Globe recently invented by Mr. Turnbull, Toronto, and published by Messrs. Selby & Co., Toronto

Class 12.—Chemistry.

This class contained some excellent Chronological Charts, including Merritt's Historical Tree of British North America.

Class 13.—Ethnography.

This class was represented by busts of celebrated Canadian Statesmen, Divines, Educationists, etc., together with a collection of colored portraits of Indians.

Class 14.—Anatomy and Physiology.

A large glass case at the end of the Court contained Anatomical Models, which included a Manikin or Model of the human body, showing its internal structure.

This case was a great attraction, and was daily surrounded by crowds of persons.

Class 15.—Zoology.

In addition to the ordinary Zoological Charts for school purposes, we exhibited a full set of Audubon's Animals of North America, chiefly of the natural size, colored from nature, with common and technical names attached. The Ontario Agricultural College, Guelph, also exhibited collections of insects injurious and beneficial to vegetation.

Class 16.—Botany.

The Models of flowers exhibited in this class were of great interest to teachers, and were acknowledged to be of great value for illustrating Physiological Botany. In addition we exhibited Botanical Charts, Flowers, Plants, and Object Lessons. The Ontario Agricultural College also exhibited specimens illustrating Systematic and Economic Botany used for teaching purposes.

Class 17.—Geology and Mineralogy.

This class was well represented by collections from the Ontario Agricultural College, including specimens illustrating the Geology of the Province of Ontario, used for teaching purposes, including the different geological groups, rocks which chiefly compose the earth's crust, minerals which constitute the majority of rocks, animals which have influenced the formation of soil, etc., also a large mineralogical collection labelled to show species, crystallographic forms, chemical formula, and locality.

Class 18.—Philosophical Charts.

This class was represented by the ordinary School Charts for teaching Natura Philosophy.

Class 19.—Physical and Chemical Apparatus.

The apparatus exhibited filled several large glass cases, and is adapted for experiments in Matter, Force and Motion, Gravitation and Molecular Attraction; Hydrostatics,, Properties of Gases, Acoustics, Heat, Light, Magnetism, Frictional Electricity, Dynamical Electricity, and Chemistry.

The following is an extract from Mr. Bowen's report :—

"The collection of apparatus was very large and very varied, and contained far more than I had time to examine or have space to write about. The general result was very satisfactory. The appliances for teaching Physical Science were very complete and good of their kind. The maps and the globes were good, especially the latter; and I noticed a particularly clever time-globe, invented, I was told, by Mr. Turnbull, of Toronto. The glass models of solids and their sections, and of crystals, were well worth notice; and in its way nothing could be better than the anatomical manikin, which could be taken to pieces and examined and then built up again. With it there were some well-executed models of parts of the human body for the teaching of

physiology. But perhaps the most striking of all was the collection of geological specimens sent by the Ontario Agricultural College, and the Experimental Farm (Guelph), illustrating the rock formation of Ontario. Nothing could have been better, or better arranged. The dissected map of the southern part of Ontario, used by the Institution for the Blind at Brantford, struck me as clever and worthy the attention of all teachers of the blind. The Bennett Furnishing Company (London), exhibit an excellent oak school-desk for two, solid, steady, and marvellously cheap; while the public school organ of Messrs. R. S. Williams and Son (Toronto), is admirably suited for its purpose."

Extract from the *Pharmaceutical Journal*:—

"The Legislature of Ontario is very liberal in its votes for the support of scientific and educational institutions. Evidence of this may be seen in the Educational Court of Ontario before referred to, which is well worthy of a visit to all interested in education and science. Apart from the large and varied collection of pupils' work from Public and Grammar Schools, Art Schools, Mechanics' Institutes, etc., there is an excellent display of physical and chemical apparatus, botanical and geological charts, botanical models, specimens of plants illustrating systematic and economic botany, insects injurious and beneficial to vegetation, geological and mineralogical collections, including rocks which chiefly compose the earth's crust, minerals which constitute the majority of rocks, animals which influence the formation of soils, etc., such as are used in Canadian schools and colleges. Altogether the exhibit is probably the best and largest display of general educational work and appliances ever exhibited by any one British colony."

In this class was a collection of School Apparatus manufactured by the Map and School Supply Co., Toronto. The *Globe* remarks on their exhibit:—

"The Map and School Supply Co., Toronto, has a large and varied assortment of educational appliances of their own manufacture in the Canadian Court. They are the largest manufacturers of school apparatus in the Province of Ontario. Mr. Chas. Potter, the senior member of the firm, supplied the globes and school appliances to the Education Department for over twenty years, during which time schools were supplied from the Educational Depository. Some of the apparatus, globes, anatomical models, etc., exhibited by the Education Department are of his manufacture, and there is no doubt that, from his long experience, he is a thoroughly practical man, well skilled in the construction and uses of all kinds of instruments for illustrating the principles of physics, chemistry, etc. This company's exhibit is classified in the official catalogue under the following heads: 1. School Furniture and Fittings, including numeral rames, with or without blackboards, sheepskin and fluted erasers, etc.; 2. Topographical illustration, including maps of the continents, a new and improved school map of the Dominion, showing the new territories, railroads, etc., and an ingeniously constructed map case, which protects the maps when not in use, and is so constructed that the maps are not liable to the wear and tear found in ordinary map cases. 3. School Apparatus. In this department they have a large display of instruments for experiments in pneumatics, hydrostatics, hydraulics, electricity, heat, etc. The exhibit is a useful one, and the school teachers of Ontario may justly feel proud that they have apparatus manufactured in their own Province which will bear comparison in excellence of manufacture with those from older countries."

Class 20.—Pupils' Work—Kindergarten.

Exhibits in this class were sent from the Provincial Model School and the Public School, Toronto.

Mr. Bowen says:—

"*Kindergarten Work.*—I learnt with the greatest satisfaction that the Kindergarten, in connection with the Public School system, has been introduced into Toronto, Hamilton, and Berlin; that at Toronto *all* primary teachers receive Kindergarten training; and that each of the Provincial Normal and Model Schools at Toronto and Ottawa has a Kindergarten teacher on its staff. This is exactly as it should be, except, perhaps, that *all* teachers whatsoever would be immensely benefited by, and should be required to possess an acquaintance with Frœbel's principles and methods. The above arrangements have only been in full force for some two or three years, so that the results shown are necessarily somewhat immature, especially in the examples of color. I noticed some maps on glass which seemed to me to have aims other than Frœbelian—to indicate an endeavor to impart to children information which they are not ready to make use of for themselves; while some of the wool-knitting was, I imagine, a little too

elaborate for children of the Kindergarten age (4 to 8). I dare not venture to criticise further, for it is essentially the spirit, manner, and method in which the children are led to work, and not the work itself, which renders their employment a Fœbelian *training* instead of a mere mechanical occupation ; and it is just these three that no exhibition of work done can show. I can say, however, that the little people already evince considerable neatness and skill in their folding, and cutting, and pattern making.'

CLASS 21.—PUPILS' WORK—PUBLIC AND SEPARATE SCHOOLS.

This class was represented by a large number of schools in cities, towns, villages, and rural districts, and included nearly 10,000 separate exhibits of Copy Books, Drawing Books, Maps, Arithmetic, etc.

In addition, specimens of pupils' work were sent from the Normal and Model Schools at Toronto and Ottawa, and the High Schools and Collegiate Institutes.

The *Canadian Gazette*, referring to the galleries, says :—

"Especially interesting in this gallery are the specimens of work from the 5,300 public and separate schools of the Province. Here is represented work done by children from seven to fourteen years of age. The drawing and map work is excellent, especially in the Toronto public schools, and in the separate schools of Ottawa."

Extracts from the *Schoolmaster* :—

"There are in the Canadian Education Court no less than 1,273 exhibits in connection with the work of the public schools. These have been arranged and classified by Dr. May, under whose guidance we made a careful survey of selected specimens, which have been sent over as fair samples of the daily outcome of the Normal and Model Schools, the Public and High Schools, and the Collegiate Institutes. The Kindergarten work is excellent of its kind, and shows the results of the training in the Provincial Model School, Toronto, and of the Public Schools of the same city. From 5,316 schools there has been sent a varied and excellent collection which represents the ordinary work done by children from seven to fourteen years of age.

The drawings exhibited have been taken from the work in progress in the schools in the middle of the term, and, although showing considerable skill, are scarcely a fair example of the improvement which can be made in a full session. We can speak favourably of the specimens which were placed before us by Dr. May. In all the departments of school work which we have specified there are excellent examples of what can be accomplished in the free institutions of a country which has not yet resorted to the degradation of its schools by the infliction of percentages, or the illusory payment by the pass."

Further extracts from Mr. Bowen's report :—

He says : "I will now go more into details, and I trust that it will not be considered presumptuous if here and there I offer a few suggestions. I do not pretend to have made by any means an *exhaustive* examination of the material exhibited, so that no inference whatever must be drawn from my silence on any point, or any omission to mention any school or other institution

Writing.—On the whole the writing was highly creditable in all grades of schools, especially in the case of the girls. I was particularly attracted by the clean finish of the work sent in by the fifth class of the Ottawa Model School and the Waterford Public School—in both cases girls ; while the Hamilton Collegiate Institute showed that good writing is not incompatible with a higher education. Indeed, it was surprising, and a matter of decided congratulation, how very little distinctly bad work was to be found at all amongst so many hundreds of specimens. The one fault to be found—and it was quite a general one—was a slight tendency to too much 'flourishing,' even in the best specimens. It was evident that the very satisfactory results exhibited had been obtained by constant care and watchfulness, for there seemed to be nothing new or particularly striking in the system of exercises employed. I cannot but think, however, that even better results would be got—or at any rate time would be saved—if elementary freehand drawing were made more distinctly *introductory* to, rather than only *supplementary* to, writing. I do not mean by this that drawing should make writing one of its chief aims, but that it should come before and prepare the way for writing.

Composition.—Many very creditable essays were exhibited—short stories, descriptions, accounts of the subjects treated in object lessons, etc. I was somewhat surprised however, to find that grammar is held to be the introduction to composition. The right introductiou is literature—at least so it seems to me—beginning with the simplest poems and stories, and rising

gradually to the more difficult—from *John Gilpin* to Burke and Shelley and Shakespeare. I doubt whether any of our best writers could pass, or could ever have passed a respectable examination in formal grammar. We learn to write well by acquaintance with good writing. However, as I have said, many of the essays shown were very creditable ; though, if I remember aright, this was generally in the case of elder pupils who would have already studied some literature.

Arithmetic.—Of this subject there is not much to be said. Except in the case of Toronto, the work sent in by the Public Schools, though satisfactory in most cases as to method, was hurried and untidy. Amongst the specimens of arithmetic and book-keeping sent in by the Ryerson, Wellesley, Dufferin, and Jesse Ketchum Schools, I noticed that a very large majority were decidedly good—well reasoned, and the reasoning well set forth, and the book-keeping neatly written.

Geography.—I looked over several papers of questions and answers on this subject ; but found all of a very ordinary type. As to Map-drawing, the smaller maps were, in general, neat and tolerably accurate ; but I did not notice that they were drawn on any particular plan. I should like to recommend a modification of Mr. Swinstead's 'central-line' plan as a good one. The larger colored maps deserve praise, especially some of those from the country schools. Several, however, were too crowded with names. It struck me that a good deal of time must have been spent over these maps, perhaps more than map-drawing really deserves.

History.—The history answers in the papers I looked at were intelligent, and on the whole satisfactory. May I hint that pictures again would considerably help the boys and girls to realize what they read about—pictures of individuals, places, buildings, scenes, etc. Dr. May told me that it is recommended for the use of High Schools that small busts of celebrities be used with the ancient history. This seems to me an excellent idea.

English Grammar.—The papers on this subject seemed generally satisfactory—the analysis and parsing were in most cases well done. I do not, however, consider it altogether a good plan to allow the use of 'forms' in analysis. I see that the 'general directions' lay down that the elementary parts of grammar should be learnt inductively, which is excellent. But the traces of induction were not very clear in the papers."

Mr. Bowen's concluding remarks :—

"I feel that I have not noticed half as much as I might have done, had I had more time at my disposal ; and I dare say some of the teachers of Canada—my *fellow* teachers, may I not call them ?—will not agree with all of my remarks. But of this let them be sure, that I have been very strongly impressed with the educational activity and efficiency of Ontario ; that I have derived not only considerable pleasure, but also considerable profit from their admirable exhibit, which does such high credit to everyone concerned ; and that I am more than ever convinced that the Old Country has already very much to learn in educational matters from her great daughter beyond the sea. May that daughter go on and prosper continually—and she *will* prosper, no one can doubt, as long as—in the words written proudly over her Court in South Kensington —she makes the goodness of the education she so liberally gives one of her chief claims to glory."

See also the notice on pupils' work given in the description of Educational Court, by the editor of the *Globe Colonial Exhibition Supplement.*

PART II.

MECHANICS' INSTITUTES.

About fifty Mechanics' Institutes sent specimens of Drawing, including Freehand Geometry, Perspective, Model, Blackboard and Primary, Machine Drawing, etc. Several beautiful models were also exhibited by members of Institutes, and some excellent specimens of wood-carving.

The following extract on Mechanics' Institutes is from the *Globe* :—

"We append some further notes on the exhibits in the Ontario Educational Court from institutions partly under the control of the Provincial Government. It should be noted, to the credit of the Province, that the Ontario Government is very liberal in encouraging mechanics and artisans to improve their spare time by reading and studying the different branches of science applicable to their respective pursuits. It is mentioned in the Exhibition catalogue, prepared by Dr. May, that the Mechanics' Institutes receive from the Government two dollars for

every dollar expended up to the sum of 400 dollars per annum. The value and extent of this pecuniary support may be guaged, from the simple fact that last year no less than 147 of these Institutes were in existence. Respecting the work accomplished at them, it is apparent that drawing, suitable for mechanics, is one of the most popular subjects of study. As many as fifty institutes send to the Exhibition specimens of examination work in freehand, geometrical, perspective, model and memory drawing. In addition we notice the following :—

Carleton Place Mechanics' Institute sent a large collection of specimens of machine drawings ; these, we understand, are chiefly done by workmen employed in the workshops of the Canadian Pacific Railway. They exhibit considerable skill, and reflect great credit on the teachers, who, we are informed, were trained at South Kensington. Probably the most interesting, ingenious and beautiful piece of work showing industry and perseverance, is a working model of an English locomotive engine, made to the scale of one inch to the foot, exhibited by Mr. Lacey R. Johnston, President of the Institute. This model has been greatly admired by persons interested in machinery, who pronounce it to be one of the most perfect and ingenious working models ever exhibited. This same Institute also contributes a beautiful ornamental inlaid table, the work of Mr. A. Parker, and a model of dwelling-house or shanty as built by the early settlers in Canada by Mr. James McVety.

Guelph Free Library exhibits some very choice specimens of carving in wood by Mr. J. O'Brien and several students.

Garden Island Mechanics' Institute is well represented. Mr. Anthony Malone, President of the Institute, exhibits a perfect model of a dram of timber as prepared for running the rapids of the River St. Lawrence. Ten or more of these drams are lashed together and called a raft. It is remarkable that the rafting and forwarding of square hewn timber for the Quebec market was commenced at Garden Island, from which this model is sent. In 1844, Mr. Dileno Dexter Calvin established a business for forwarding timber at Garden Island. This business, including ship-building, has been carried on by the same family up to the present day ; it is now a prosperous town with one of the best Mechanics' Institutes in Canada. During the past season, 1835, there was forwarded from the port of Kingston to Quebec, square oak timber, over 1,700,000 cubic feet ; elm and ash, over 1,000,000 cubic feet ; square and waney pine, over 2,700,000 cubic feet. The vast forests of Canada, which are said to be practically inexhaustible for home consumption and the probable demands of commerce for centuries to come, are a source of great wealth to that country. The exports of timber last year amounted to over $20,000,000.

Mr. Archibald Cumming exhibits a very beautiful working model of a harbor tug steam engine from the same Institute.

Galt Mechanics' Institute sends some excellent specimens of machine drawing, done by workmen employed in the Grand Trunk Railway workshops.

Port Perry Mechanics' Institute exhibits a large collection of drawings, including freehand, linear perspective, practical geometry, mechanical drawing, shading, etc.

Whitby Mechanics' Institute contributes a collection of drawings in freehand, perspective, and shading and outline from the round.

The people of Ontario are to be congratulated on the excellence of this portion of their exhibit, which has largely contributed to show visitors at the Exhibition the industry, zeal and perseverance of the working classes of the Dominion in obtaining practical knowledge, invaluable to them in their daily life, and in rendering them intelligent and self-reliant citizens."

The *Canadian Gazette*, in a lengthy article on Education in Ontario, observes :—

"That since the time of Confederation, Mechanics' Institutes have been established, an annual grant given to each Institute by the Local Government, provided it supplies a library, reading-room, and evening classes. This important branch of the public service has been in the hands of the Provincial Education Department since 1880, and is now directed by the Minister of Education, to supply practical education of value to adult artisans. There are about 150 of these Mechanics' Institutes in operation throughout Ontario, in a population of only two millions, and of these between sixty and seventy are now branches of the Art schools. The work from several Institutes is now on display in the Court. From it may be gathered that a practical knowledge of drawing is imparted—first, by freehand ; second, by geometry and perspective ; and third, by industrial drawing. The industrial designs prepared at these Mechanics' Institutes have elicited general commendation. Mechanics, practical chemistry, and the various branches of physics, are also taught in these Institutes, thus bearing directly upon the textile and other manufactures of the country."

The *Press* says :—

"The work from the Mechanics' Institutes has attracted a great deal of attention from manufacturers and others in connection with the growing recognition of the importance of training mechanics and artisans in industrial drawing."

PART III.

ART SCHOOLS.

The students of Art Schools in Toronto, Ottawa, London, and Kingston, contributed largely to the success of the Educational Exhibit. The large collection of Drawings, Paintings, Carving on Wood, Modelling on Clay, Plaster Casts, Painting on China, etc., were much admired, and especially so the specimens of Industrial Designs, which were acknowledged by experts to be of considerable merit, and valuable exhibits from a new country, showing as they do that encouragement is given by the Government to the development of artistic work applicable to trades and manufactures.

The Marquis of Lorne was so much pleased with some of the designs for wall paper from Toronto, that he recommended me to place them in the hands of some English manufacturers. This I could not do, as they are the property of the students.

Before leaving England, having received an intimation that Her Majesty the Queen would be pleased to accept a few specimens of Art school work from Ontario, I selected some exhibits from the different departments, and forwarded them with a letter referring to our advancement in industrial Art education during the past few years, and the great interest H. R. H. the Princess Louise and the Marquis of Lorne had taken in the promotion of Art work during their residence in Canada.

In reply, I received the following letter from General Sir Henry Ponsonby, Private Secretary to the Queen:

OSBORNE, January 8th, 1886.

DEAR SIR,—The articles forwarded by you arrived here to-day, and I have given them to the Queen, who was very much pleased with them, and has commanded me to thank you for sending these well-executed specimens of the work of the Students of the Art Schools, Education Department, Toronto.

I have the honor to be, Dear Sir,

Yours faithfully,

(Signed) HENRY F. PONSONBY.

Each of the Art Schools had separate compartments for the display of their exhibits.

The British press made frequent notice of the excellence of this section of the Educational Court.

The following extract is from the *Canadian Gazette*:—

"The work from these Art Schools of Ontario is such as would do credit to many older countries. The origin of some of the exhibits is interesting. In view of the Exhibition, the Ontario Manufacturers' Association offered medals for the best designs for various manufacturing purposes, and Dr. May, as Superintendent of Art Schools, at once issued circulars to the schools, notifying them to prepare forthwith various designs. The Toronto School designs were prepared for paper-hangings; in Ottawa for iron-work, such as railings, fences, etc.; in London, designs for sideboards, etc.; and in the Kingston School for mantlepieces and overmantles. Considering, then, the fact that no selection is made in the exhibits in this class, all the competitive designs being shown, and that but a fortnight was allowed for the work, Ontario has reason to be proud of the result. It unquestionably forms a most important part of the Court. From the Toronto School of Art there also comes excellent work in electro-metallurgy taken from plaster casts and electrotypes from nature, as well as models in clay, and plaster casts from clay. Good industrial designs are also shown. The Art School of London comes out strongly in painting on china. Even the baking is done at the school, and the product is excellent, illustrating a frequent means of livelihood for young ladies in the Province. By the Kingston exhibits mechanical work is illustrated in such a way as to call forth the admiration of the principal of the South Kensington Art School. The Ottawa designs, especially the original industrial designs, are also excellent, and the complete system by which the eye of the pupil is trained to exactness of detail cannot but elicit admiration. Carving in wood is also shown from the branch Art schools, of which there are over fifty established at Mechanics' Institutes, all receiving Government assistance. The specimens from Guelph speak well for the progress made in this section.

Extract from Mr. Bowen's report :—

Art.—In passing on to the higher departments of Art proper, I feel myself to be getting on to uncertain ground, which is usually set about with warnings to tresspassers, and notices 'not to touch the flowers.' However, as I have little but praise to bestow, I hope that any accidental impiety will be forgiven me. I will try to keep on the gravel walks. First, then, I noticed some very striking needlework (flowers) from Loretto Convent, (Hamilton), and some really beautiful artificial flowers from the Loretto Abbey (Toronto).

The Ladies' College, at Brantford, have also contributed some rather ambitious work in oil and water-colors. The machine drawing and the carving in wood sent in by the Mechanics' Institutes, formed a most interesting collection, including many specimens of really excellent work; as did also their freehand drawings. But the most attractive and most memorable exhibit of all was the large and varied collection of Art work from the Art Schools of Toronto, London, Ottawa, and Kingston. The time at my disposal was all too short to allow of my doing full justice to all its many merits in detail. But the general impression made on me—especially in the case of Ottawa—was one of considerable pleasure, and—if I may be honest without offence—not a little surprise. The mere enumeration of the varieties of work from the Art Schools is sufficiently striking; life studies, oils and water-colors, freehand drawings of every kind, industrial designs, architectural and machine drawings, shading from the antique and from the flat, chasing in brass, modelling in clay and plaster casts from clay, carving in wood, painting on china, and even electro-metallurgy and repoussè work. It is somewhat difficult to know what to mention amongst so much. I may say, however, that the advanced work generally of the Ontario School of Art (Toronto) was excellent: the wall-paper patterns showed great taste in design and coloring; the drawings from the antique were very good indeed, but perhaps a little too heavily shaded; and the wood-carving, metal-work, and plaster casts were, in many cases, highly creditable. I noticed, by the way, a portrait of Dr. May in plaster, which, though undoubtedly like, was by no means flattering. The Western School of Art (London) showed some very good painting on china. The Ottawa School of Art deserves very decided praise. The paintings of flowers and plants, with industrial designs invented from them, were delightful—excellent in form and composition and color. The life-studies were very good indeed; and the water-colors were highly creditable. The drawings of a wrought-iron fence, and the collection of industrial designs, which were shown at the recent Antwerp Exhibition, deserve very decided praise. From the Kingston Art School the original designs for industrial uses were again strikingly good.

PART IV.

INSTITUTIONS FOR THE BLIND, DEAF AND DUMB.

Exhibits were sent from the Ontario Institution for the Education of the Blind, Brantford, consisting of appliances for teaching and pupils' work; similar exhibits were also sent from the Ontario Institution for the Education of the Deaf and Dumb, Belleville.

These exhibits were greatly admired; the ladies' work from the Blind Institution, as well as the ingenious appliances for teaching, came in for a full share of praise: the photographs from Belleville, showing the employments as well as amusements, were also of great interest.

Probably a larger number of persons made enquiries about these Institutions than might have been expected, because a Royal Commission was sitting which had been appointed to institute enquiries as to the systems adopted by different countries for the instruction of the Blind and Deaf and Dumb. It caused great surprise to visitors when they found that these excellent institutions are under the management of the Government, as they did not expect a colony would thus take the initiative in providing institutions under Government control for the education of our fellow citizens who are deprived of seeing or hearing.

The press made comments on this subject because similar institutions in the United Kingdom are dependent for support upon voluntary subscriptions.

The following letter refers to one of these notices :—

Royal Commission of the Blind, the Deaf and Dumb, etc.,
32 Abingdon Street,
Westminster, 6th March, 1886.

Dear Sir,—I have been favoured with an extract from the *Canadian Gazette* of October 28th, which states that you could furnish us with ample information regarding the Institution of the Deaf and Dumb and Blind in Canada. If it were in your power to do this it would be gratifying to the Commission. We are most anxious to ascertain the practices and general views of our Colonies and of foreign countries, so as to enable us to report fully on the matter to the Queen with a view towards legislation.

I remain, etc.,
C. E. D. BLACK.

I made an appointment with the Secretary, and afterwards sent all the printed reports, etc., in my possession, including a special report by the late Rev. Dr. Ryerson on the Education of the Blind and Deaf and Dumb in Europe and the United States.

Extract from *Canadian Gazette* :

"We find that Ontario has taken a decided lead of England in the provision of free education for the deaf and dumb and blind. The Ontario Institution for the Deaf and Dumb is at Belleville, and is open for a period of seven years to all deaf-mutes from seven to twenty years of age who are not deficient in intellect, and are free from contagious disease. This institution was established by the Ontario Government in 1870, at an expenditure of 200,000 dollars. The whole tuition is free, but those who are able to pay are charged 50 dollars (£10) a year for board, and non-residents in the Province 125 dollars (£25) per annum. The modes of instruction are the most modern known to the civilized world, following what is termed the 'combined' scholastic and industrial system. Every attention, too, is paid to physical training. The gymnasium, games, and calisthenic exercises form an essential part of the curriculum, and a glance at some photographs of the members of the Mute Pantomime Club and the Football Club will certainly astonish those who are unaccustomed to see in deaf-mutes such a high development of mental and physical powers. The Ontario Institution for the Blind was established at Brantford by the Ontario Government in 1873, at an expenditure of 22,000 dollars. The course of instruction is divided into three departments. In the literary department a sound English education is given. The musical department embraces instruction in pipe and reed and string instruments, and it is worthy of note as showing the high standard attained that several ex-pupils of the institution are employed as tuners by Messrs. Mason & Risch, the well-known pianoforte makers of Toronto. Then, thirdly, there is the industrial department, comprising instruction for male pupils in basket and chair making and pianoforte tuning, and for females in sewing machine, sewing, embroidery, and kindred work. The blind institution is thus supplementary to the public school system of the Province, and admits those whose sight is so impaired as to prevent their receiving instruction by the ordinary methods. Hence it is not necessary for a pupil to be entirely blind to benefit by the advantages of the institution. The models used for the manufacture of baskets, etc., are claimed to have considerable advantages over those in general use ; while the remarkable crochet, bead, and other work which is contributed by female pupils, is a powerful testimony to the efficacy of the methods adopted. Natural history is also taught at schools, pupils being accustomed to the forms of animals by excellent mounted specimens. Another exhibit from the institution is worthy of note. It is a map of Ontario, dissected so that each part, representing a county, can be taken away. On the face of the map the rivers, boundaries, railways, towns, cities, etc., are depicted by means of indentations and small nails of various sizes. A child, thus guided by the shape of each county, the identations, and the small nails, is able to gain an accurate knowledge of the geography of this Province such as could not otherwise be imparted."

PART V.

COLLEGES OF AGRICULTURE, VETERINARY SCIENCE, Etc.

The Ontario Agricultural College and Experimental Farm, Guelph, was well represented. In addition to Statistical, Experimental, and other large Charts and photographs

beautifully mounted, this Institution exhibited very valuable collections of Geology and Mineralogy, Plants, Models, etc., used for teaching purposes; also Agricultural seeds, collections of insects, etc.

The whole exhibit filled over twenty small glass cases besides covering several hundreds of feet of wall space.

Application was made for the loan of a portion of these exhibits for the Agricultural Exhibition at Norwich. I sent some charts, etc., and subsequently received a letter from Mr. Dyke, Emigration Agent for the Dominion, stating that some of the leading continental agriculturists were desirous of getting copies of these charts for their colleges.

I may state that the Ontario Agricultural College ranks very high in the estimation of the old country. I was frequently told by men of experience, acquainted with the methods employed for teaching Agriculture in different countries that there was no Agricultural College in the world superior to the Ontario Agricultural College for imparting instruction to young men for practical farming.

I had so many enquiries as to the terms, etc., that I thought it desirable before leaving England to publish a short description of this Institution, and accordingly prepared a long letter, which, through the courtesy of the editors, was printed in the *Field*; the text of this letter was copied in other papers. The following is from the *Globe*:—

"THE ONTARIO AGRICULTURAL COLLEGE.

"In consequence of numerous enquiries as to the facilities for obtaining in Canada thorough education in practical farming, Dr. May contributes to the *Field* a brief account of the Agricultural College maintained by the Government of Ontario at Guelph. He writes:—

'The Ontario Agricultural College and Experimental Farm is situated near the city of Guelph, in the centre of an extensive agricultural and stock-raising district. This institution, established by the Government under the administrative control of the Commissioner of Agriculture, has for its object—1, to give a mastery of the practice and theory of husbandry to young men engaged in agricultural or horticultural pursuits, or intending to engage in such; and 2, to conduct experiments tending to the solution of questions of material interest to the agriculturalists of the province, and to publish the results from time to time. The college buildings are very spacious and commodious, and the farm consists of 550 acres, about 400 of which are cleared. It is conducted by an able staff of professors and instructors, and fitted with modern appliances for giving a thorough and practical knowledge of every branch of agriculture.

'Professor Sheldon, of the Wilts and Hants Agricultural College, England, in a recent report says: 'It is a flourishing, though quite a young institution; and its influence is being felt in the agriculture of the province. The students receive an agricultural education in which science is happily blended with practice, and theory is borne out by demonstration.'

'The instruction given at the institution is embraced under two heads—a course of study and a course of apprenticeship. The course of study is divided into five departments: 1. Agriculture, including reclamation of lands; preparation, cultivation, and succession of crops; improvement of soils and lands; breeding, rearing, and feeding of animals; implements of the farm; general economy and business of the farm; arboriculture, etc. 2. Natural science. 3. Veterinary science. 4. English and political economy. 5. Mathematics and book-keeping.

'The course of apprenticeship is divided into five departments: 1. The farm department, including dairying. 2. The live-stock department. 3. The horticultural department. 4. The mechanical department. 5. The experimental department. In these departments the students are required to work every alternate afternoon, and for one hour every morning. For this labor they are paid at a rate per hour fixed by the farm superintendent, and the payments are credited to the board accounts.

'Young men whose parents are non-residents in Ontario, are permitted to enjoy the advantages of this institution on the payment of the following fees: 1. Those who have served an apprenticeship of one year on a Canadian farm, £10 per annum. 2. Those who have not served an apprenticeship on a Canadian farm, £20 the first year, and £10 the second year; board, lodging, and light, 10s. per week. About thirty per cent. of the students are from other countries, including the United Kingdom, the United States, etc.

'In a brief sketch it is, of course, impossible for me to point out all the advantages young men, intending to become practical farmers, can obtain by attending the Ontario Agricultural College, but I will enumerate a few of them. Students have an opportunity of becoming fairly skilled in the general work of the farm. A portion of the farm is laid out in small plots, and a series of experiments with cereals, roots, grapes, manures, and various modes of management is regularly and systematically carried on from year to year. In the live-stock department there

are nine breeds of cattle, nine of sheep, and three of pigs, kept for the purpose of instruction, and experiments are made to test by feeding, the comparative value of different kinds of feed. As an illustration of the practical character of this kind of work done at the farm, I may refer to the large charts exhibited by this institution in the Ontario Educational Court at the Colonial Exhibition, showing food in cattle life, ten years at the farm ; milk per season, 12 cows ; chemical analysis of milk, 11 cows ; cream per cent., 11 cows ; butter globules, result of twenty-one microscopic observations at farm, 12 cows ; butter per 100 lb., milk and cream, 11 cows ; cheese per 100 lb., milk and cream, 11 cows. I may remark, *en passant*, that some of the leading Continental agriculturists have applied for copies of these charts for use in their colleges. The student can also obtain a practical knowledge of gardening, as there are three greenhouses, a large kitchen garden, a vinery, a 30-acre lawn, an arboretum, and a large variety of fruit and ornamental trees. He is also trained in the use of carpenters' tools—a most invaluable acquisition in pioneer life. He obtains a knowledge of the structure and functions of farm animals, and the most approved methods of treating and preventing diseases to which such animals are liable ; and, finally, I may say that, by the systematic teaching employed, his mind is expanded, his reasoning powers increased, and he becomes an ardent admirer of nature, and a nobler specimen of true manhood.

'Now, a few brief words showing why Ontario is considered such a bonanza by parents desirous of educating their children in that grand science which makes the true nobleman of nature. The Province of Ontario embraces an area of about 200,000 square miles, nearly 80,000 more than the United Kingdom. It is enormously rich in minerals ; its forests are so vast that they are capable of supplying all the timber required for home consumption and every probable demand of commerce for centuries to come ; its rivers and lakes are abundantly supplied with fish, and its forests with game. It is famous for oil-springs and prolific salt-wells ; but the great element of national wealth is its soil and the products thereof. The Hon. David A. Wells, an eminent American statesman, in an article in the *North American Review*, says : 'The Province of Ontario is as fair a country as exists on the North American continent. It is the natural habitat on this continent of the combing-wool sheep. It is the land where grows the finest barley. It raises and grazes the finest of cattle, and its climatic conditions, created by an almost encirclement of the great lakes, specially fit it to grow men. Such a country is one of the greatest gifts of Providence to the human race, better than bonanzas of silver, and rivers whose sands contain gold.' I may also remark that the climate of Ontario is one of the most pleasant and healthful in the world ; the old description of Canadian seasons—six months of summer and six months of winter—has no application whatever. The winter in the southern part of Ontario usually begins about Christmas, and lasts until the latter part of March ; further north it begins about the middle of December, and breaks up during the first or second week in April.

'The exports of agricultural products from Ontario are annually increasing. As the agricultural statistics show the total exports of the Dominion, it is impossible to give the exact proportion exported by the Province of Ontario ; but it is usually computed that Ontario furnishes five-sixths of the whole. The value of exportations were as follows in 1885 : Horses, $1,640,506 ; cattle, $7,508,043 ; sheep, $1,264,811 ; cheese, $8,902,115 ; butter, $1,430,905. During the past half century the number of the population (now over 2,000,000) has been multiplied by seven, and the area of land in occupation (now 23,300,000 acres) by thirteen, and this extraordinary development has taken place by steady and continual progress, without any phenomenal expansion followed by collapse.

'In conclusion I may remark that there are 129 free grant districts in Ontario, each containing 50,000 to 60,000 acres, and other districts will be opened up as railroads and colonization roads are constructed. By an Act passed during the present year, the head of a family can obtain a free grant of 160 acres of land, and single men, over eighteen years of age, 120 acres. The amount of money required to make a successful settlement upon a free grant is from £60 to £100. Improved or cleared farms can easily be obtained by those desirous of residing near old settled districts. The average price for good farms, including buildings, in the old settlements, is from £10 to £15 per acre ; but in new settlements, partially cleared, farms can be purchased for from £1 5s. to £3 per acre.

(Signed) S. PASSMORE MAY, M.D.

This letter gave rise to considerable correspondence, in addition to enquiries from persons with from £1,000 to £5,000 capital anxious to benefit themselves. Further information was asked for in regard to the College, by parents intending to send their sons to Canada, and in more than one instance propositions were made that the parents themselves should purchase farms and reside in this country so soon as their sons could undertake farm management.

The Ontario Veterinary College also had an exhibit in this class.

The following extract from the *Globe* sufficiently explains the excellence of this exhibit:—

"Ontario Veterinary College, Toronto.—Probably one of the most attractive exhibits in the Educational Court are the large photographs from the Ontario Veterinary College, consisting of views of the College, dissecting rooms, operating rooms, portraits of students, professors, and principal, etc. The Ontario Agricultural and Arts Association was, by Act of Parliament, empowered to establish a Veterinary College, for the instruction of pupils in the science and practice of the Veterinary Art, and as to the breeding of domesticated animals. So far back as 1862 a series of lectures on agriculture was given at Toronto University College, and Professor Smith, the present Principal and Proprietor of the Ontario Veterinary College, gave lectures in connection therewith. In 1869 part of the premises now occupied was built, and the institution has gradually grown until it has reached the proud position of being one of the largest and most popular veterinary colleges in the world. Over 600 students have graduated from this College, and there are more than 300 students in attendance during the present session. There is a full staff of professors, who lecture on anatomy, physiology, materia medica, chemistry, the diseases of domesticated animals, pathology, etc. There are large and well-ventilated dissecting rooms, an excellent museum and a Veterinary Medical Society, which meets twice a week for the discussion of subjects in connection with the advancement of Veterinary Science. The opportunities for actual practice are very great; the total number of cases, independent of cattle, treated in the infirmary in connection with this College during the month of April, 1886, was 1,074, and 84 horses were examined for soundness. Special attention is given to diseased cattle, for which there are great advantages in Toronto, as 2,600 head of cattle are fed in one establishment alone in that city from October to June.

"It is very gratifying to find that, through the energy, perseverance, and untiring industry of the Principal, this College draws students in large numbers from all parts of the neighboring Republic. The exhibit at South Kensington is greatly admired, particularly by the ladies, who gather in crowds to look at the photographs of the students, representing as they do different countries and different climes, gathered together in a Canadian College to obtain a knowledge of one of the most noble professions—that of alleviating the pain and sufferings of the brute creation. We may remark that Her Majesty the Queen took a great interest in this exhibit when visiting the Educational Court, soon after the opening of the Exhibition."

The *Canada Gazette* refers to this College as being the largest of its kind in the world.

PART VI.

SCHOOL OF PRACTICAL SCIENCE, SCIENTIFIC SOCIETIES, AND COMMERCIAL COLLEGES.

The School of Practical Science, Toronto, exhibited specimens of Drawings from the Department of Engineering, including Orthographic Projection, Perspective Projection, Surveys, Graphics, Machine Drawings, Construction Copies, Construction Designs, Stone Cuttings, Surveys, etc., etc.

The Institut Canadien Français exhibited Crayon Drawings, Indian Ink and Pencil Sketches, Mechanical Drawings, Architectural Drawings, Perspective, Map Drawings, Penmanship, etc.

The Business Colleges were represented from Brockville, Hamilton, and Owen Sound.

The *Colonial Exhibition Supplement* remarks:—

"There are exhibits from the Brockville Business College, Brockville; Canada Business College, Hamilton; and Northern Business College, Owen Sound. These Colleges send a remarkably fine collection of Penmanship, including Commercial Forms, Business Letters, Cards, Off-hand Flourishing, Pen-and-ink Sketches, and various kinds of ornamental penmanship, which show a great amount of artistic training, worthy of high commendation.

"In addition, Mr. W. C. Austin, Principal of the Brockville Business College, exhibits sets of books (in the theory and actual business department) just finished by one of the students, representing the work actually done by the students; also balance-sheets, samples of money and

merchandise used by students in the actual business department of the College ; text-books, etc., showing the thoroughly practical training young men can obtain in this College before their entrance into commercial life. We have already congratulated Ontario on the excellence of her public school system, which is generally acknowledged to be equal, if not superior, to any in the world ; we can also sincerely congratulate the Province on the excellence of her business colleges, where young men receive an education which is specially adapted to assist them in overcoming the difficulties usually found at the beginning of a commercial career. These exhibits are displayed on the principal entrance archway, and are a source of great attraction."

PART VII.

UNIVERSITIES, COLLEGES, SCHOOLS OF MEDICINE, Etc.

The Universities were represented by photographs only, with the exception of Victoria University, Cobourg, which sent publications of societies in connection therewith. Upper Canada College sent specimens of Writing and Drawing.

The Ladies' Colleges had a large exhibit. Alma College, St. Thomas, sent a valuable collection of Freehand Drawings, Perspective, Geometry, Shading from Antique, Outlines from the Round, etc. This College is in affiliation with the Ontario School of Art for examination purposes. Ontario Ladies' College, Whitby, also in affiliation with the Ontario School of Art, had an excellent exhibit of Freehand Drawings, Original Designs, Shading, Water Colors, etc. The Ladies' Colleges, Brantford, Hamilton, and Woodstock, had large collections of Oil and Water Color Paintings.

Extract from *Colonial Exhibition Supplement* :—

"Proceeding now to the galleries, Art is prominent on the walls of the right gallery. Here the contributions come from the Ladies' Colleges, at Woodstock, Hamilton, Whitby, Brantford, and St. Thomas, and are as varied as they are excellent in character."

The Loretto Abbey, Toronto, and Loretto Convent, Hamilton, sent Oil and Water Color Paintings, Crayon Drawings, Embroidery, Honiton Lace, Modelling in Clay, etc.

Each of the Colleges was allotted separate compartments, which were prominently labelled, showing name of Institution, name of Exhibit, Residence, Description of Work, etc.

The following remarks are from the *Globe* :—

"The Roman Catholic Colleges.—In our last issue we referred to exhibits in the Educational Court, from institutions not under control of the Education Department. Amongst these are exhibits from Roman Catholic Colleges, which are remarkable for their excellence, and at the same time are evidence of the kindly feeling which exists in Ontario between Catholics and Protestants. The Education Department of Ontario, representing as it does the Government, sets an example worthy to be copied by older countries in thus acknowledging all creeds and giving prominence to exhibits where prominence is due.

"The exhibits from the Roman Catholic Colleges are displayed so well and so conspicuously as to reflect great credit on Dr. May in the arrangement of the Court. These Colleges have their special alcoves in the centre of the principal gallery, and articles liable to injury from exposure are placed in handsome glass cases made specially for these exhibits.

"Want of space forbids our referring to all the articles exhibited. The following brief notes may, however, be of interest : The Loretto Abbey, Toronto, sends some beautiful work done by the pupils, including Oil Paintings, Oil on Velvet, Water Colors, Crayon Drawings, Embroidery, Wax Flowers, etc. It may not be generally known that this Abbey is a branch of an Institute which has been for more than two centuries devoted to the instruction of youth. The mother house was established in Rome, and so far back as 1683, houses in connection therewith were established in this country. In 1882, the community established a house at Rathfarnham, near Dublin. To this first Irish foundation the Mother Superior gave the name of 'Loretto' from the House of Nazareth, now at Loretto, in Italy. All filiations from the mother house have carried the name with them, and it has become very familiar in Canada, representing as it does academies and convents in several of the principal cities and towns. The Toronto Abbey provides a liberal course of instruction in all branches of knowledge required in the education of

young ladies, including ancient and modern languages, instrumental and vocal music, fine arts in various branches, embroidery, needlework, etc., also domestic economy; the same course of instruction is pursued in the main in all the Convents and Academies of Loretto in Canada.

"The collection of pupils' work from Loretto Convent, Hamilton, is also very beautiful. It embraces Oil Painting on China, Water Colors, Modelling in Clay, Satin Stitch and Applique Work, Honiton Lace, etc, and shows the results of the excellent teaching and the liberal education imparted by the ladies of Loretto.

"The Educational Court also contains large framed photographs of other Catholic Educational Institutions besides those of Loretto, including the Sacred Heart Academy, London; Convent de Notre Dame, Peterborough, and St Joseph's Convent, Toronto. They are all magnificent buildings, in commanding and healthy positions, surrounded with spacious grounds; and those interested in education should not fail to examine these proofs of the zeal and enterprise of the Roman Catholic ladies of Ontario."

Photographs of Toronto School of Medicine, Royal College of Pharmacy and Surgery, Kingston, and the Ontario Pharmaceutical College, were also exhibited. The *Globe* says:—

"It will, perhaps, interest some of our readers who may be visiting the Colonial and Indian Exhibition, to mention that in the Educational Court of Ontario there is a large photograph of the Ontario College of Pharmacy, and we think our Canadian friends are to be sincerely congratulated on their success in building so handsome and commodious a structure.

Conclusion.

The question may arise, What benefit has our Province derived from its Educational Exhibit in England? To this I would reply, That amongst the five and a-half millions of visitors it has, no doubt, imparted information to hundreds of thousands of people who previously knew little or nothing of Canada. It has opened up new avenues of thought as to the value of the productions of our fertile fields, and the great wealth from our inexhaustible fisheries. It has enabled them to judge of the value of education upon the industrial development, national wealth, prosperity and happiness of our people.

It has given them a knowledge of the immense territory and natural resources of this Province, which, with a population of only about 2,000,000, has nevertheless increased nearly 500 per cent. during the past fifty years, about 100 per cent. more than the proportionate increase during the same period in the United States.

We have shown, too, that our knowledge and intelligence has been increased by our free system of education, and this is of consequence, as it is generally acknowledged that the supremacy of a nation, either in peace or war, depends upon the intelligence of its people.

In these days of science, when time and space may be said to be almost annihilated, and intercommunication between distant countries so easily established, the competition is such that it becomes necessary for manufactured goods to be of artistic design, well constructed, and at the same time produced so cheaply as possible by the aid of labor-saving appliances. We have proved that our Government assists in developing the latent talent of the industrial classes, by teaching the branches of knowledge which enables them to construct and manufacture these labour-saving appliances, so valuable in the hands of skilled artisans. If we take drawing as an example, the teaching of industrial drawing is now made compulsory in the schools, and is fostered and encouraged in the Mechanics' Institutes of this Province. Educationists and manufacturers both say that industrial drawing is the foundation of industrial education; they substantiate this by showing that every mechanic should possess some knowledge of drawing, and prove from calculations that the productive efficiency of machine shops would be increased one-third if every mechanic could read working drawings so as to work by them.

In this manuer our Educational Exhibit has enabled the people of different nations to judge for themselves of that system of education, which we claim has promoted and inculcated self-reliance, preserving industry and rapid advancement in all which tends to the civilization and prosperity of a country.

I may further state that the Educational Exhibit from Ontario was of great interest in England last year, because of the recent change in the school law, requiring school

fees to be paid in advance. In London the fees are fixed with reference to the social condition of the neighborhoods in which the schools are placed. The average fee of the London School Board is a small fraction over four cents per week.

The new law requires these fees to be paid in advance, and if not paid the parents are prosecuted in a criminal court, for the technical legal offence of not having sent their children to school. This law came into force on the 4th October, 1886, and the day preceding (Sunday) a mass meeting was held in Trafalgar Square, denouncing this new rule of the School Board and advocating free education. The excitement was considerable, and the press, generally, discussed the question as to *Fee* or *Free* Schools.

As may be supposed, numerous enquiries were made as to the working of the Ontario Free Public Schools. I gave all the information in my power, and liberally distributed the pamphlets relating to the School System of Ontario. I also sent copies of the pamphlet to the members of the London School Board, at the same time offering to meet them, individually or collectively, to give any further information if required. Finally, at the request of several prominent educationists, I prepared the following letter, which, by the courtesy of the Editor, was published in the *Schoolmaster*, the leading educational paper in the United Kingdom :—

FREE EDUCATION IN THE PROVINCE OF ONTARIO, CANADA.

In consequence of the recent discussion in the public press on Free Schools, I have had numerous inquiries at the Colonial Exhibition as to the management of the Free Schools of Ontario ; and as the question of *free* or *fee* still continues to be agitated, it has been suggested to me that before leaving England I make known to the public, so far as possible, the educational system in relation to Free Schools in Ontario ; and as I know of no better channel than the *Schoolmaster*, I have to ask you kindly to give space in your valuable columns for that purpose.

I shall not make comparisons of the methods employed in other countries, neither shall I take up space by giving a detailed historical sketch of the rise and progress of our public school system, which commenced so far back as 1816, but refer only to the present position of the Free Public Schools of Ontario, and to make this more comprehensive I shall divide the subject into different headings.

Administration.

The administration of the Educational System of Ontario is provided for by statute as follows :—There shall be a Department of Education, which shall consist of the Executive Council, or a committee thereof, appointed by the Lieutenant-Governor ; and one of the said Executive Council, to be nominated by the Lieutenant-Governor, shall hold the office of "Minister of Education." It will thus be seen that the Minister of Education is under control of the representatives of the people.

The duties of the Minister of Education are very onerous, amongst which he has power to make regulations for the classification, organization, discipline, and government of Normal, Model, High, Public, and Separate Schools ; for the equipment and ventilation of school-houses ; for the arrangement and requisites of school-premises ; for the authorization of text-books for the use of pupils ; to appoint Inspectors of High Schools, Separate Schools, and County Model Schools, Masters of Provincial Normal and Model Schools, and Directors of Teachers' Institutes ; to provide for the training of teachers ; to make regulations for granting the pensions provided by law for superannuated Inspectors and Teachers, etc.

I noticed in the press of last week that Mr. Matthew Arnold, in his parting words to the teachers assembled together to do him honor on his retirement from public life, said : "Insist on having a Minister of Education. What we want in a Minister of Education is this : a centre where we can fix the responsibility. Insist, therefore—as you, the chief sufferers, by mistakes and neglects in the management of Education, have a right to insist—insist on having a Minister of Education."

I need only remark that in Ontario we have a responsible Minister, who is responsible to the teachers and responsible to the people, and the advantage of this system is

that we can get a thoroughly practical man. The present Minister of Education, the Hon. George W. Ross, LL.B., has been a Public School Teacher and Inspector, and Model School Inspector. He is, therefore, conversant with all the details of school management; and his administration gives satisfaction to Teachers, Inspectors, and School Trustees, as well as to parents and children.

Free Schools.

All *Public Schools in Ontario are free schools*, and every person between the age of five and twenty-one years has the right to attend some school.

In 1850 the Legislature invested each school division, or section, with power to decide annually for itself whether the schools should be entirely free. In 1866 the ratepayers themselves had made more than four-fifths of the schools free. The question of free schools was subsequently thoroughly discussed, and it was decided that the property of all should be made liable for the education of all. There was an almost unanimous opinion that all persons should contribute to the education of the youth of the land according to the amount of property they possessed, it being contended that property is better protected and increased in value where the education, intelligence, industry, and enterprise of all the people are encouraged. The Public Schools were thus all made absolutely free by the voice of the people.

Local Management, and Appointment of School Trustees.

A system of Municipal or Local Government is uniform throughout the Province, which rests upon the free action of the ratepayers of each municipality. The organization comprises minor municipal corporations, consisting of townships; county municipalities governed by a council of the heads of the minor municipalities; villages with a population of over 750; towns with a population of over 2,000; and cities with a population of over 10,000. The Rev. Dr. Ryerson, the founder of the Ontario System of Free Schools, thus describes the facilities afforded to educational progress by the municipal system:—"It is in Upper Canada (now Ontario) alone that we have a complete and uniform system of municipal organization, from the smallest incorporated village to the largest city, and from the feeblest school section and remotest township to the largest county or union of counties—the one rising above the other, but not superseding it—the one emerging into the other for purposes of wider expansion and more extensive combination. By their constitution, the municipal and school corporations are reflections of the sentiments and feelings of the people within their respective circles of jurisdiction, and their powers are adequate to meet all the economic exigencies of such municipality, whether of schools or roads, of the diffusion of knowledge, or the development of wealth."

On the incorporation of any city, town, or village, an election of school trustees is held; the persons qualified to be elected trustees must be actual resident ratepayers—that is, assessed householders, whether owners or tenants, or persons assessed for income; and every ratepayer of the age of twenty-one years, who resides within the municipality, is entitled to vote at any election for school trustee, or on any other school question. Therefore the trustees are appointed and controlled by the people themselves. As representatives of the people, they are practically the owners of the schools.

Duties of School Trustees.

The trustees prepare the estimates of the sums required for all school purposes, including purchase of Site, Building, Furniture, Teachers' Salary, etc.; these estimates are laid before the Municipal Council, which has power to levy and collect upon all taxable property within the municipality sufficient sums to meet the requirements of the school trustees.

The trustees are under obligations to provide adequate school accommodation, as defined by the Education Department, for two-thirds of the actual resident children of school age; to appoint a sufficient number of teachers, who must possess the qualifications required by the Department; to permit all children of school age to attend school *free* of

charge. To see that no unauthorized books are used in the school, and that the pupils are supplied with a uniform series of authorized text-books sanctioned by the Education Department. To provide maps, apparatus, libraries, etc. To take possession and have the custody of all public school property. To visit the schools under their charge from time to time, and prepare annual reports on forms prescribed by the Education Department. They have the power of dismissing refractory pupils, and they can exempt indigent persons from the payment of school rates. They are bound to keep the schools open the whole year, except during vacations.

Legislative Assistance.

Large sums are annually granted by the Legislature to be apportioned by the Minister of Education amongst the municipalities, on condition that they raise by rate a sum equal, at least, to that apportioned to them, both amounts being solely devoted to the payment of teachers' salaries.

The Legislative Grant averages only about 7 per cent. of the total amount raised for public schools. The amount of Legislative Grant in 1884 was two hundred and sixty-seven thousand dollars, whilst the total receipts for all public school purposes was no less than three million, seven hundred and thirty thousand dollars.

This, of itself, is a sufficient proof of the excellence and popularity of the Free School system, inasmuch as the people voluntarily tax themselves for it maintenance and support.

Public School Inspectors.

The Inspectors are appointed by the municipal councils, and must have had practical experience in teaching. They must either be holders of first-class provincial certificates, or graduates in arts, with first-class honors, of a provincial university, and furnish evidence of having taught successfully for five years, of which three at least must have been spent in a public school.

The duties of an Inspector are to examine into the methods of instruction, ascertain the progress made by the pupils, see that the schools are properly equipped, and that no unauthorized books are used in the school. They have the power to withhold the school grant; they apportion the school grant according to the average school attendance of pupils; they can grant temporary certificates for teaching, or suspend teachers' certificates for cause. They have to report to the Education Department, and see that its laws and regulations are observed.

The powers of Inspectors are very great, but they are trained, responsible men, in whom the ratepayers have confidence; and that it is not misplaced, can be judged from the great progress made in the education of the children, as evidenced by the exhibits of pupils' work at the Colonial Exhibition, which received commendatory notices from leading educationists and the press in general. Nearly every school under their inspection is provided with wall maps, the total number in use being over 40,000; a large number of the schools are also supplied with globes and school apparatus. Great improvement has been made in the school buildings, which are now well ventilated, and provision made for the comfort of the children by properly constructed seats and desks, etc. School architecture has made wonderful progress in the Province, because the Inspectors advise with the trustees, in erecting good permanent buildings, adapted for school purposes. The large photographs of our Schools at the Exhibition were admired by thousands of persons, who were surprised to find that, with a population of less than two millions, we have 5,375 Public Free Schools, many of which, in architectural beauty of design, are equal to those found in older and wealthier countries. As stated at the commencement, it is not my intention to discuss school methods, but I do most earnestly direct attention to the importance of having school Inspectors selected from trained teachers, and invested with all the necessary powers to promote the efficiency and general welfare of the schools in their charge.

PUBLIC SCHOOL TEACHERS.

The conditions on which public school teachers' certificates may be granted, are prescribed by the Department. The certificates issued are—first-class, grades A, B, and C; second-class, and third-class. First and second-class certificates are valid throughout the Province, and are held during good behavior, while the third-class are limited to a period of three years. The holder, however, may, on passing the Departmental Examination, obtain a renewal of the same for three years, subject to attendance at a County Model School. There can be no renewal without re-examination. In an emergency the Minister of Education has power to extend the duration of a certificate. Third-class certificates are granted by County Boards of Examiners, the School Inspector being chairman of the examining board in his district. Second-class certificates are granted only on condition that the candidates have passed the non-professional examination in literature and science, held at the High Schools; must have taught successfully for at least one year in a Public School in the Province, and must have attended for one session a Provincial Normal School.

First-class certificates are granted only upon the following conditions:—That the candidate (1) must be the holder of a first-class non-professional certificate; (2) must have passed the professional examination for a second-class certificate; and (3) must have attended a training institute for one session, and passed the prescribed examination thereat.

In 1884 Ontario had 7,085 public school teachers; 235 held first-class certificates; 2,237 held second-class certificates; and 3,420 held third-class certificates; the balance having temporary certificates. The number of male teachers was 2,789, and female teachers 4,296.

The Minister of Education, in his annual report of 1884, says, in reference to the standard of the teachers employed: "It will be noticed that there is an increase of twenty-four in the number holding provincial first-class certificates. This increase, in view of the demand for teachers possessing the highest attainments, is very gratifying. Owing to the superior culture required for teachers of this rank, the number eligible for a certificate is necessarily limited. There is, also, a very large increase in the number holding second-class certificates, namely, from 1,201 in 1876 to 2,237 in 1884, while at the same time the number of third-class teachers is being gradually reduced. These are two very satisfactory features of the progress of education. The steady increase in the number of teachers of a higher grade shows:—(1) That the facilities afforded by our High Schools for a higher education are made use of. (2) That those entering the profession are disposed to seek the higher literary culture which a second-class certificate represents, and (3) That those possessing that higher culture are sought for by Boards of Trustees. It must not be forgotten that, other things being equal, the best educated man or woman invariably makes the best teacher. There is still, however, a tendency on the part of some teachers to remain satisfied with any qualification which entitles them to conduct a Public School."

The Minister, in referring to the marked increase in the salaries of teachers during the past few years, says: "There is a considerable discrepancy still between the salaries paid to females as compared with males. Why should this be, when the services rendered are, in most cases, of equal value?"

The Public School Teachers of Ontario are, as a class, an influential body. They are popular, well-educated men and women, careful and painstaking, endowed with zeal and energy in promoting the great cause of education, having a fellow-feeling and sympathy with each other; with a proper estimate of the dignity of their profession, and a desirability that it shall never be disgraced by word or deeds of theirs. It is not surprising, in such a large and influential body, many of its members rise to positions of prominent honor in Ontario. The Minister of Education at one of the High Schools, in a speech last month, said:—"The Ontario Assembly contained, perhaps, more teachers in proportion to its members than any other legislative body in the world, and men on both sides of the House were willing and able to aid and improve the educational system."

In my own experience I have known Public School Teachers become leading statesmen, eminent divines, celebrated lawyers, and distinguished physicians. There is no

reasonable limit to the position to which they may aspire, and within their reach for the true advancement and government of their country; for although they may not, like natives of the neighboring republic, aspire to become President, we have a proof that one of their co-workers holds one of the most prominent and important positions in the country, as Minister of Education.

The Legislature is most liberal in promoting the welfare of teachers; it provides free education for them at Normal Schools, Model Schools, and Training Institutes, and also assists by liberal grants towards supporting a Teachers' Institute in each county inspectoral division, having for its object the reading of papers and the discussing of matters that have a practical bearing on the daily work of the school-room. The Director of Teachers' Institutes visits the Institutes, and takes part in the proceedings by discussing at least three subjects on the programme, and by delivering a public lecture. Every teacher, unless prevented by illness, must attend continuously the meetings, which last for two days.

Departmental Regulations.—Accommodation for Pupils, School Furniture, Etc.

The trustees are required by law to provide sufficient accommodation for at least two-thirds of the population between five and twenty-one years.

The school site must be in a healthy locality, with proper drainage. The water-closets for the sexes must be several feet apart, and proper care taken to secure cleanliness, and to prevent unpleasant and unhealthy odors.

The school-house must have an additional room for every fifty persons. In each room there should be at least 250 cubic feet of air-space for each pupil. Arrangements must be made for ventilation so as to secure a complete change of atmosphere three times every hour. There must be separate entrances and suitable cloak-rooms for boys and girls.

The desks and seats are usually so graduated in size that the pupils' feet may rest firmly upon the floor, and the backs of seats slope backward from the perpendicular to add to the comfort of the pupils.

Under the regulations, every school should be supplied with at least, Blackboards, 9-in. Globe, Maps of Canada, Ontario, World, the different Continents, Tablet Reading Lessons, Numeral Frame, Dictionary, Gazetteer, etc.

These regulations are applicable, more especially to schools in rural districts, as the schools in cities, towns, and villages are usually well equipped with maps, apparatus, reference library, etc.

Departmental Regulations.—Text-Books.

The programme of studies prescribed for use of Public Schools is as follows:—Reading and Literature, Spelling, Othography, and Orthoëpy Writing, Arithmetic, Drawing, Geography, Music, Grammar and Composition, History, and Object Lessons. Other subjects recommended to be to be taught are Hygiene, including Temperance, Drill and Calisthenics, Moral and Religious Instruction, Reviews and Recitations, and Agriculture in Rural Schools.

The Department of Education has the authorization of the text-books used by the pupils; and recently, under the direction of the Minister of Education, an admirable set of readers adapted to the country has been published, also a set of Drawing Books, Works on History, Hygiene, Scripture Readings, etc. Some of the other text-books used are by Canadian authors, and others reprints of English publications.

The advantages from a uniform set of text-books cannot be over-estimated. They are selected by a Central Committee of Examiners, all experienced, competent advisers. They are suitable to the youth of our country, and should a pupil remove from one part of the Province to another, the same set of books can be used; and, moreover, there is no temptation for interested persons to recommend publications from which they might reap a profit.

Drawing has only been made compulsory since July, 1885, but its importance as a branch of education is already fully recognized. It is the written language of the eye, with an alphabet of only two letters—the straight line and the curve. It is especially the language of mechanics and workmen, and most valuable in the manufacturing progress of a country.

Departmental Regulations—Religious Instruction.

Every school is opened with the Lord's Prayer, and closed with reading portions of Scripture taken from selections authorized for that purpose by the Department, and must be read without comment or explanation, but no pupil is required to take part in the religious exercises against the wish of his parent or guardian.

The clergy of any denomination have the right to give religious instruction to the pupils of their own church in each school-house at least once a week.

It will thus be seen that everything in reference to religious exercises is left to the parents and guardians of the children, the Government exercising no authority, but fully recognizing and protecting the rights of conscience and parental authority in all religious matters.

Compulsory Attendance.

The parent or guardian of every child, not less than seven years nor more than thirteen years of age, is required by law to cause such child to attend a public school or some other school in which elementary instruction is given, for the period of 100 days in each school year, unless there be some reasonable excuse for his non-attendance.

The law is very explicit on the duty of guardians. It says :—"Any person who receives into his house a child of any other person, under the age of thirteen years, and who is resident with him, or in his care or employment, shall be deemed thereby to be subject to the same duty with respect to the elementary education of such child during such residence, and shall be liable to be proceeded against as in the case of a parent, if he should fail to perform his duty of causing such child to be educated to the extent required of a parent."

Children employed in factories are only compelled to attend one-half of the whole time required by the Act, provided they have certificates from the School Inspectors that they have passed an examination prescribed by the Education Department.

As a rule, no compulsion for children to attend school is required, the parents and children themselves seem to appreciate the true value of education. The compulsory clauses in the School Act, however, shows the taxpayer, who is rated without his consent for school purposes for the public good, that children are compelled to attend school.

School Purposes.

The term "Separate School" applies to Protestant and colored persons as well as to Roman Catholics ; but this exception to the general public school system is confined chiefly to Roman Catholics, who desire to establish Separate Schools in localities where their supporters are sufficiently numerous to support one. The principle of the Schools is, that any Roman Catholic ratepayer may elect to support a Separate School, and upon giving the prescribed notice he is exempted from the Public School rates. These Schools are governed by trustees, who are elected by the supporters of such Schools, and are a corporation with powers similar to those of other school trustees. The teachers are required to possess proper certificates of qualification, and the Schools share in the Legislative Grant in proportion to the attendance, and they are also subject to inspection by the Education Department, two Inspectors having been appointed for that purpose. In case of any disagreement between the Separate or Public School corporations and the municipal bodies, such dispute is subject to the arbitrament of the Minister of Education, with the right to appeal to the Lieutenant-Governor in Council.

There are 207 Roman Catholic Separate Schools in Ontario.

Concluding Remarks.

Every year's experience shows more fully that the Free Public School System in Ontario is founded on the true principle for the education and advancement of the people. The Government, knowing that education has the effect of sharpening the perceptive, and strengthening the reasoning faculties, considers that the education of all the youth of the country is a national duty, to which every person should contribute according to the property he possesses, and which is protected for him by the State.

Every facility is provided for the training of teachers. (*The Times*, September 21st, says:—"Evidently very great care is bestowed on the training of teachers for the various classes of schools in Ontario. The examinations which they have to undergo are formidable and comprehensive, and for the higher grades quite as formidable as that of the London B. A., and far more varied.") Every precaution is taken to secure in them good moral character, as well as competent literary qualifications; and the result is that many of the children of the poorer classes, by their intelligence, industry, and perseverance, have become leading men in the professions, prominent merchants, and holders of other positions of trust in the country.

It is true that it causes a kind of levelling process, as the children of the poor man sit side by side and compete with the children of the rich man. It might be considered in some countries as partially breaking up the distinctions of class, but we find that it teaches self-respect, and all classes learn to know and respect each other.

The result of our education is that we have individual security, public peace, and that freedom of action consistent with rational liberty in a country which is rapidly increasing in wealth and prosperity.

Although far removed from the splendor of royalty and the influence of a court, we train our children to be law abiding. We are loyal subjects of our Queen, and we love and venerate our mother country; not from antiquated prejudice, nor reluctantly tolerated from a sense of duty; but, on the contrary, it is cherished in our affections, and supported by the freewill of a people whose love of order has been strengthened as their knowledge has increased, who value that Government which so ably affords security to life and property, and whose laws ensure the actual enjoyment of all that deserves to be dignified with the name of freedom.

In conclusion, I may state that the Free Public School System of Ontario is generally acknowledged to be equal to any in the world. It has been imitated by other countries including some of the neighboring states and, at least, one colony in Australia. And in addition to this grand scheme for primary education, there are provisions for secondary and higher education, which are essentially free; and the poor man's son, provided he has talent and energy, receives free education from the Public School to the University.

With a population less than 2,000,000 we have upwards of 5,000 Public Schools nearly 200 Classical Schools, Colleges and Universities, and 150 Mechanics' Institutes and Art Schools, where adults can obtain a practical knowledge of subjects connected with their various trades and employments.

As stated in the public press, the goods exhibited in the Canadian section of the Exhibition show great advancement in the various manufactures; the workmanship is excellent, the designs are good, and there is ingenuity in construction, which can only be attributed to the practical education of the people.

I have endeavored to show this during the past few months; I have also sent copies of a pamphlet relating to the Educational System of Ontario, and a catalogue of our exhibits to H. M. School Inspectors, Clerks of School Boards, and the members of the London School Board; and I shall be pleased, during the short time at my disposal, to give any further information, if required.

S. PASSMORE MAY, M.D.,
Commissioner of Education.

Colonial Exhibition Building, London, November, 1886.

As very few persons in this country are familiar with the School Statistics of the United Kingdom, I take this opportunity of stating that in 1885 there were 29,912 Elementary Schools inspected, with accommodation for 6,734,423 pupils. The actual attendance was 4,329,324. Within the past twenty years the schools have increased over fifty per cent. and school attendance over seventy-five per cent., although the population has only increased about twenty-five per cent. during the same period.

The cost to the country for public education is very great, the sum submitted on the Civil Service estimates for 1887 is $23,876,625. It is money well expended, however, for crime has diminished in proportion as public education has increased. The number of committals for criminal offences in 1865 was 27,388, in 1885 the number was 18,500.

It is worthy of notice here, that whilst free education costs the Province of Ontario only about fifty-seven cents per pupil, the amount for education, not free, paid by the Government of the United Kingdom, is over $5 per pupil.

It will be seen from this report that every opportunity was taken to bring before the public the excellence of our educational system, and the agricultural and commercial advantages we possess in this province.

I may remark, too, that I referred to this on different occasions at public meetings, where I had the privilege of giving addresses, including the Guildhall, London College, Training Colleges, Public Libraries, etc. Some of these meetings were largely attended. For instance, at the Guildhall some thousands of persons were present at the presentation of the Queen's prizes, Science and Art Department. The Lord Mayor was in the chair, and Prince Henry of Battenburg gave his first address in public. On this occasion I referred to our Free Education, the influence of Industrial Drawing on manufactures, and the commercial progress, natural resources, climatology, etc., of this province. On the following day I received a letter from the Principal of the Technical Schools, thanking me for my attendance and address.

In conclusion, I cannot refrain from acknowledging my sincere thanks to Sir Charles Tupper, the Executive Commissioner for Canada, and Mr. C. C. Chipman, Accountant of the Canadian Commission, for their many acts of kindness, and the personal interest they always took in promoting and forwarding the interests of the exhibitors and representatives of the Educational Court of Ontario.

The following Provinces, in addition to Ontario, sent educational appliances and pupils' work, which were exhibited in an annex adjoining one side of the Ontario Educational Court:

Province of Quebec.

The educational exhibit of this Province was represented during the Exhibition by the Hon. Gideon Ouimet, Superintendent of Public Instruction.

Their special catalogue shews that they had 164 collections of educational exhibits, which were classified as follows:—1. Department of Public Instruction, including Reports, School Acts, Text Books, etc. 2. Universities—Photographs and Books. 3. Classical Colleges—Photographic Views, Books, etc., from six Colleges. 4. Normal Schools—Specimens of pupils' work, Text Books, etc. 5. Academies, Model Schools and Elementary Schools—Photographs and pupils' work, including Writing Books, Daily Exercise Books, Needlework, Drawing Books, Map Drawing, etc., from eighty-five schools. 6. City of Montreal, Roman Catholic and Protestant Board of School Commissioners—Photographs and pupils' work, consisting of Writing Books, Exercise Books, Book-keeping, Map Drawing, Head Drawing, Landscape Drawing, Painting on Satin, Needlework, Crotchet-work, etc., from sixty-four schools.

The pupils' work was chiefly exhibited in handsomely bound albums, the contents of which were greatly admired by those interested in education, containing as they did a great variety of well executed examples of the ordinary school work of the children.

The Commissioners publish the following as a preface to their catalogue:

"The Educational exhibit which we have prepared, does not adequately represent the state of education in the Province of Quebec. The short time which our superior educational institutions and our elementary schools had to prepare for the great educational display has prevented many institutions from taking part. Several of our scholastic institutions, which could have prepared excellent exhibits, finding themselves unprepared

and fearing that they might compromise their well-deserved reputation by a hurriedly prepared exhibit, have abstained from taking any part in the present display. Such as it is, our exhibit represents the regular work carried on in our elementary schools and in our institutions of superior education; and we venture to hope that, under the circumstances, these illustrations of the results of our educational system may meet with the approval of the specialists appointed to examine them."

The Council of Arts and Manufactures of the Province of Quebec, also exhibited a collection of drawings done in the class-room by pupils from fourteen to twenty-one years of age.

New Brunswick.

This exhibit was represented by Mr. Ira Cornwall, jr. It consisted of:

School Work:—

Specimens of Print Script Exercises, Writing, Maps, Industrial Drawing, Sewing and Knitting. (Arranged in bound folios.)

School Furniture:—

Desks and Seats, and Teacher's Desk.

Text-books:—

One copy of each Text-book prescribed for use in the Schools of the Province.

School Apparatus:—

One Set Drawing Models; one Set Blocks to illustrate Form; one Set Natural History Series to illustrate Plant and Animal Life; Weights and Measures; Specimens of New Brunswick Woods and Minerals, as used for illustrative purposes; Crayons and B.B. Rubbers; Ball Frame; Map of New Brunswick.

School-houses:—

Photographs of School-houses and of Class-rooms; Plans of School-houses.

School System:—

Outline of School System; Outline of Course of Instruction; School Manuals.

School Reports:—

Annual Reports; Blank forms for Inspectors' Reports; Blank Forms for Trustees' Returns and Teachers' Reports.

School Registers, etc.:—

School Register and Cover; School Licenses; Provincial School Drafts; County School Fund Drafts.

The Academy of Arts and Free Night School, St. John, New Brunswick, sent a collection of Freehand Drawings from Nature in Charcoal and Crayon.

Nova Scotia.

The Hon. Wm. Annand represented this exhibit, which consisted of a collection of School Desks and a Teacher's Desk, manufactured in Nova Scotia.

School Cabinet of Nova Scotia Minerals (arranged by Pupils of Pictou Academy).

Etomological Collection, in twenty-four cases, (Pictou Academy).

Case containing Prescribed Text-books.

Six Drawings of Prescribed Plans for School-houses.

Eight Photographic Views of Educational Buildings.

Collection of Maps, Copy-books, Essays, Text-books, etc., etc., illustrating Work and System of the Institution for the Deaf and Dumb, Halifax, Nova Scotia.

Collection illustrating the System of the Halifax School for the Blind, with specimens of Pupils' Work.

Large Portfolio containing specimens of Needlework by Pupils of the Public Schools of Nova Scotia.

Collection of Maps drawn by Pupils.

Collection of Drawings by Pupils.

Four Portfolios containing specimens of Pupils' Work in Drawing, Map-making, Grammatical Analysis, Parsing, Penmanship, etc.

Specimens of Educational Forms.

Collection of Reports, School Law Manuals, Courses of Study, University Calendars.

Small Collections of Sundries, Woodwork by Pupils, etc.

Drawings by Pupils in the Provincial Normal School, Truro.

PRINCE EDWARD ISLAND.

Collective Exhibit :—

St. Dunstan's College.—One book containing one small and four large Architectural Elevations ; one Tracing Book do.

Prince of Wales College.—One book containing one Illuminated Title, Pen work, and four Maps.

Public Schools.—One Book, twelve Maps.

St. Dunstan's College Examination Papers.

One Album of Penmanship, do.

Examination Papers, Prince of Wales College.—Charlottetown Public Schools, Marshfield—St. Peter's Boys' School.

Three Copy Books, Elementary.

Collection of Text-books for Schools and Colleges.

Departmental Reports, etc.

MANITOBA.

Collective Exhibit of Educational Appliances, Books, Exercises, etc., from the Catholic Schools of the Province.

Educational Exhibit, consisting of Primary Reading Charts, Text-books, School Furniture, and samples of Pupils' Work on Writing, Composition, Book-keeping and Map Drawing, from the Protestant Schools of the Province.

APPENDIX.

OTHER COUNTRIES WHICH EXHIBITED.

In order to show the extent of the British possessions and how universally Her Majesty's subjects united to make known the greatness of the British Empire by exhibiting the products, manufactures and educational appliances of their respective countries, I shall give a brief historical sketch of each country from facts collected from authorities at the exhibition, and from their special reports, with short notices of their educational systems and exhibits.

The accompanying map is colored (*red*) to show the geographical position of each of these countries.

AUSTRALASIAN COLONIES.

Australia.

Australia was originally a simple Crown Colony; the first settlement was made by the British Government at Sydney, in 1788. At present Australia is divided into five Colonies; all on the mainland, viz.: New South Wales, Victoria, South Australia, Queensland and Western Australia.

Each of these Colonies is presided over by a Governor appointed by the British Crown, but with the exception of Western Australia otherwise self-governing.

New South Wales.

New South Wales, the oldest Colony of Australia, was discovered by Capt. Cook in 1770. The first governor was appointed by the British Government in 1787, and the Colony of New South Wales was formally declared to be founded in 1788.

In 1851 the south-western districts of New South Wales were formed into the Colony of Victoria, and in 1859 its northern districts into the Colony of Queensland.

It is bounded on the *north* by Queensland, on the *west* by South Australia, on the *south* by Victoria, and on the *east* by the Pacific.

It includes an area of 309,175 square miles, and in 1886 the estimated population was 981,000. Its chief product is wool, which is exported to England. It was in this Colony that gold was first found in Australia, in 1851. The aggregate value of the gold mines up to 1884 was $176,807,750. Coal is also found in abundance; the aggregate value of coal mining up to 1884, was $78,546,400. Other minerals are also abundant in New South Wales; the aggregate mineral wealth of all kinds up to 1884, being $320,342,925

New South Wales is rich in educational institutions. Sydney, the principal city, has a population of 250,000, and is the first town in Australia that was settled. There is a University, Denominational College, Grammar School, School of Arts, Technical, Industrial and Sanitary College and Museum, Natural Art Gallery, Free Public Library, Public Schools, etc.

The Public Instruction Act which is administered by a responsible Minister, came into operation in 1880. The schools are entirely undenominational, and the attendance of children between the ages of six and fourteen years of age is compulsory. The school fee is 3d (6 cents) per week per child, and the fees collected are paid into the treasury as revenue. Provision is made for educating children whose parents are unable to pay fees. Teachers are recognized as civil servants, and paid by salary out of the public funds. School Buildings are erected wholly at the expense of the Government.

Since 1861, Parliament has voted nearly $30,500,000 for Primary Schools. The annual expense for school sites, buildings, furniture, etc., averages over $3,500,000.

In 1885 there were 2,046 State School in operation, viz.: 8 High Schools, 26 Superior Public Schools, 1,532 Public Schools, 294 Provincial Schools, 150 Half-time Schools, 50 House-to-house Schools, under itinerant teachers, and 12 evening Public Schools. There are also two Training Schools for teachers. The total school population is nearly 280,000, nearly a third of the entire population of the Colony.

Educational Exhibit.

The greater part of their educational exhibit was from the Technical College, Sydney; it consisted of specimens representing the following classes:—1. Modelling, Plaster Casts; 2. Carpentry and Joining, practical; 3. Masonry, arches, etc.; 4. Naval Architecture, models, etc.; 5. Plumber's; 6. Art Class, drawings; 7. Carriage Building, drawings; 8. Carpentry and Joining, theoretical; 9. House Painting, graining and marbling; 10. Art Decorations, ornaments; 11 Architecture, drawings.

A Geological Class Map was also exhibited by this College.

Twelve Public Schools sent exhibits of pupils' work, consisting chiefly of sewing and fancy work, which was in great variety and well executed; the few specimens of writing and map drawing sent were not sufficient to judge accurately of the general work done in these branches.

The Surveyor General, the Government Astronomer and the Minister for Mines, sent several very finely executed maps and charts for scientific purposes.

There were also private exhibits of drawing models and scientific apparatus.

VICTORIA.

This colony lies at the south-eastern extremity of the Australian continent; its area is 88,198 square miles. Although the least of the Australian colonies it is the most populous, having one million inhabitants. Victoria was first settled in 1833, by an Englishman; it then formed part of New South Wales, and was known as the Port Philip District. Melbourne its chief city, which now has a population of 325,000, was founded in 1837.

In 1851, Port Philip became a separate colony, and was named "Victoria" in honor of the young Queen. In this same year (1851) the discovery of gold gave the colony an impetus, which is said to have "uplifted the colony in a night to the position of a nation and a power in the world, and advanced her destinies hundreds of years at one bound." Victoria was crowded with searchers for fortune from every quarter of the globe, in one year nearly 80,000 immigrants being added to the population of the colony.

The total value of gold raised in Victoria from 1851 to 1885 is estimated at over $1,500,000,000.

During this year (1851) the first Lieut-Governor was sworn in. Responsible government was not, however, introduced until 1855.

They have a system of State Education in Victoria, the basis of which is that secular instruction shall be provided, without payment, for children whose parents may be willing to accept of it, and that whether accepted or not, satisfactory evidence must be produced that all children between the ages of six and fifteen are educated up to a given standard. The result is reported as very satisfactory. In 1881, of every 10,000 children of school age (between the age of six and fifteen), 9,481 could read, and 8,535 of them could write.

Schools of Mines have been established at Ballarat and Sandhurst, to which are attached museums, containing geological and technological specimens, models of mining machinery and mining plant, sections of mines, etc. There are 880 students in these two schools.

Schools of Design have also been established at twenty-five other places in Victoria, for promoting technological and industrial education. There are over 2,800 pupils on the rolls of these schools. An exhibition of the pupils' work is held yearly in Melbourne and local exhibitions are held in other cities and towns.

They have also a University, which, in 1880, was thrown open to females, who are admitted to all its corporate privileges, except as regards the study of medicine.

In 1884, the number of students who matriculated was 173, of whom nine were females.

Educational Exhibit.

This colony had a small educational exhibit, but there was no attempt to make it a prominent feature in their section of the Exhibition.

The Minister of Education sent a small collection of specimens of pupils' work, Models of Schools, and Photographs, with an Excellent Map showing the whole of the State Schools in the colony.

The Victorian Deaf and Dumb Institution sent specimen exercises on Written Language, Writing, Arithmetic, and Drawing, Photographic Views, Statistics, Reports, etc.

The Victorian Asylum and School for the Blind sent Baskets, Mats, Nets, Woolwork, etc., the work of the pupils, also Photographic Views of the Buildings and Pupils at Work.

Trinity and Ormond Colleges sent photographs.

The Oberville School of Art sent examples of Sculpture, Drawing, and Painting in Oils, and Imitation Tapestry.

Private exhibitors sent some Object Lessons and Philosophical Instruments, and the public departments exhibited Maps and Charts, including a raised Map of Victoria, showing existing and proposed lines of railways.

The pupils' work exhibited was excellent, and it is to be regretted that a larger collection was not sent.

SOUTH AUSTRALIA.

This colony is, with the single exception of Western Australia, the largest of all the Australian colonies, stretching across the whole island continent from south to north. The total area is 903,690 square miles. The population, according to the latest official record (1884), was 312,781.

In 1831 Captain Sturt discovered the River Murray, which runs down into South Australia, and empties itself into the Southern Ocean, but it was not until December, 1836, that the first Governor of South Australia took possession of the land in the name of the Sovereign of Great Britain.

Although gold is found in small quantities only, the copper mines of this colony have produced great mineral wealth.

The education of the people received legislative attention very early in its history. The first Act relating to education was passed in 1847. This was suspended in 1851 by an Act, the expressed object of which was to impart good secular instruction, based upon the Christian religion, apart from all theological and controversial differences on discipline and doctrines, and a Central Board of Education was established.

In 1875 an Act was passed which abolished the Central Board of Education, established a Council of Education; attendance of children between the ages of seven and thirteen years was made compulsory, and fees were authorized to be charged.

In 1878 the Council was dissolved, and the administration of the Education Department transferred to a "Minister Controlling Education," assisted by an Inspector General of Schools, with a staff of Inspectors and Teachers.

In 1884 there were 452 Public and Provisional Schools; 42,758 children received instruction from 400 male and 600 female teachers. The total expenditure upon education (exclusive of buildings) was, in 1884, over $500,000.

About 390 schools have been erected since January 1st, 1876, at a cost of upwards of $2,000,000.

Scholarships, exhibitions, and bursaries, are open to the pupils at public schools, with the advantage of education at the Adelaide University, or any approved European University. As an illustration of this, in 1878, a scholar won an exhibition at one of the Model Schools: this entitled him to free education at Prince Alfred College (the semin-

ary selected by him), and in 1884 he won the South Australian Scholarship, which is worth $1,000 per annum for four years.

In addition, the Education Department offers annually three University Scholarships (worth $250 per annum for three years), which entitle the holders to education at the Adelaide University free of cost. Six exhibitions, for scholars at the public schools, of the value of $100 to $200 each, are also available annually, and entitle the holders to free education at any of the colleges which they may select. Bursaries of the value of $60 are also offered by the department of girls.

Educational Exhibit.

The Inspector General of Schools sent a small exhibit, consisting of Maps and Plans used in the Education Department, Two Maps of Australia. Set of Arithmetical Diagrams, and Copies of Course of Instruction, Time Tables, Calendar, and Education Gazette.

The Superintendent of Poonindie Native Institution exhibited specimens of writing done by native children, also a small cottage, picture frames, and brackets made of cones.

A private exhibitor sent an Educational Object Lesson, "The Gospel Ship," and some Maps and Diagrams were exhibited from different government departments.

QUEENSLAND.

Queensland, comprising the north-eastern part of Australia, has an area of 668,224 square miles, and a population of about 300,000. It is quite a new colony, only sixty-two years ago (1825) a penal settlement was founded at the mouth of the river. In 1839 the last batch of convicts was landed there. Ten years later the first free immigrants arrived and settled down near Brisbane, the capital, which has now a population of 40,000.

In 1859 the colony of Queensland was proclaimed by Imperial command, and since that time its progress has been very great. Immediately after its separation from New South Wales a system of National Education was inaugurated, it being contended that as education progressed, crime would be lessened, and thus the colony would reap a direct advantage from the money devoted to educational purposes. A Board of Education was appointed, and a Normal School, for the training of teachers, was built in Brisbane, and Schools in towns and country districts were built on a requisition of the residents, accompanied by an amount equal to about one-fifth of the estimated cost of the building. On these conditions, wherever there were twenty children above five years of age, a school was established, and a teacher supplied and paid by the board.

At first small fees were charged, but fees were abandoned in 1864.

In 1876, the Government undertook the entire management and control of the Schools, the Attorney-General was appointed Minister of Education, and since that time the Schools have increased at a remarkable rate. There are 425 State Schools, with 46,262 children on the rolls, and 1,161 teachers employed. About one-seventh of the population of the colony is under school instruction.

Every classified teacher is a civil servant appointed, transferred or promoted only by the Governor in Council.

Educational Exhibit.

Thirty-five State Schools sent exhibits of pupils' work, including Maps, Dictation, Drawing, Ornamental Penmanship, and Needlework, altogether about six hundred specimens, representing the ordinary work of the Schools.

The Departments of Mines and Public Works, Railways, Post and Telegraph, and Public Lands, sent some very fine specimens of Maps, Charts, and Diagrams, relating to their various departments.

Physical Charts and Maps were also sent by private exhibitors.

In addition, the Reading Room in the Exhibition was supplied with files of about sixty newspapers and periodicals.

Western Australia.

This colony embraces nearly one-third of the Australian continent. Its area is over 1,000,000 square miles, with a population of about 35,000, principally located within 100 miles of the sea coast.

It is the only one of the Australian group which is still a "Crown" Colony, that is to say a British dependency, where the officials of the Government, as well as the Governor, are appointed by the British Government.

The chief products are Wool, Timber, Pearls and Pearl Shells, Lead, Copper, etc.

There are seventy-four Government Schools, with 102 teachers and 3,052 pupils, in the colony. The amount contributed by the Government for education in 1884 was about $50,000, and the amount paid by pupils about $7,000.

The Education Act in force contains compulsory clauses, and the Commissioners claim that the standard attendance, if not so high as in Victoria or New Zealand, is already on a level with that of New South Wales, and slightly in advance of Tasmania; and as the country is now making rapid progress in other directions, it is not likely the Government will permit her to fall back in the matter of public education.

There was no exhibit of educational appliances, but an excellent collection of District Maps, Photographs, and Oil and Water Color Paintings.

NEW ZEALAND.

New Zealand lies in the Pacific Ocean to the south-eastward of and at least one thousand miles from Australia. It consists of three islands and several small islets, the total area is about 100,000 square miles, the estimated population in 1885 was 576,234, exclusive of about 40,000 Maories.

Tasman visited New Zealand in 1642 and found it peopled by the Maori race. The next European who visited the country was Capt. Cook, in 1769; the Maories, its aboriginal inhabitants, were at that time cannibals, devoid of religious belief, except confused notions of good and evil demons. Capt. Cook is said to have planted in the country the first germ of colonization. Notwithstanding this, for a number of years New Zealand was only known to the civilized world for the danger of its coasts and ferocity of its inhabitants.

In 1814, the representatives of the English Church Missionary Society became the first European residents. After several years, in which the country became morally contaminated from the influx of traders, run-away sailors and adventurers, the British government interfered, and subsequently, after negotiation with the native chiefs, assumed complete possession of the country.

The constitution was that of Crown Colonies, and the Governor, except in so far as he was controlled by the Imperial Government, was almost despotic.

In 1853, a new constitution, based on the popular principle, came into force.

In 1863, the entire responsibility and control of the country was transferred from the Imperial to the Colonial Government, and the usage of responsible Government is now in full force.

Public schools are free, the cost being defrayed by an annual parliamentary vote. The amount voted for free schools in 1886 was about $17,000. They have 987 public schools, with 97,238 enrolled pupils and 2,447 teachers.

There are also seventy-one native schools for the education of the Maori race, which in 1884 cost the country over $67,000.

Several European schools, also, receive subsidy from the Government for the support of Maori pupils. The total number of Maori children receiving education in 1884 was 2,929. Endowed Secondary Schools, Grammar and High Schools, and Endowed Theological Colleges have also been established in various parts of the Colony. These are for the most part affiliated to the University of New Zealand.

The University of New Zealand is purely an examining body. It is empowered by Royal Charter to confer degrees, but it has no teachers in its employment; the teaching part of the work is done by affiliated institutions.

Educational Exhibit.

The Education Department, Wellington, exhibited a small collection of School Books, Reports and Pamphlets, and a private exhibitor sent some Drawing Books.

Maps were also exhibited by private individuals.

The Otago University sent a magnificent collection of Fish and Reptiles, stuffed and in alcohol, also Skeletons disarticulated and mounted for teaching purposes.

The Canterbury Museum had an excellent exhibit of skeletons of extinct New Zealand Birds, including the Dinornis Maximus, also Maps, Drawings, etc.

FIJI.

The Colony of Fiji is a group of islands in the South Pacific numbering over 200, of which eighty are inhabited. The total area is about 8,000 square miles, with a population of about 110,000, of which about 2,000 are white.

The Fijian Archipelago was discovered by Tasman in 1643. About the year 1804 twenty-seven convicts escaped from New South Wales and settled among the islands. These desperadoes having firearms, were dreaded by the native savages, and might have obtained absolute government of the islands; but they lived only for self-indulgence and the gratification of vile passions, some of them being regarded as monsters even by the ferocious cannibals with whom they associated.

In 1858, King Thakombau offered to cede the sovereignty of the islands to Her Majesty on certain conditions, which were not accepted.

In 1871, Thakombau, with the assistance of some Europeans, formed a government for the whole group, and the first parliament met for the kingdom of Fiji. It was found that the system of government adopted was unsuited to the condition of the country, and the Assembly was dissolved in 1873.

In 1874, Thakombau re-assembled his chiefs, and made another offer of cession with conditions which were unacceptable to the Imperial Government. Sir Hercules Robinson, Governor of New South Wales, was deputed by the House of Lords to proceed to Fiji, and the result of his negotiations was that the king and chiefs made a formal and unconditional cession to Her Majesty of the sovereignty of the islands.

The first Governor of the new dependency was appointed in 1875. Confidence in the government has grown up and these erstwhile savages are now a law-abiding native community.

Both Common and High Schools have been provided for upon a similar basis to that adopted in the Australasian colonies. Common Schools have been established in the islands of Suva and Levuka under certified teachers, assisted by pupil teachers. The Inspector's latest report shows that the attendance is regular and the educational results fairly satisfactory.

For the natives, the Wesleyan Mission have established day schools, at which about 42,000 children receive instruction. They have also a native Industrial School, educating about 100 boys from the northern provinces. The school is under European superintendence, assisted by Fijian tutors. In addition to scholastic subjects, instruction is given in agriculture, carpentering, boat-building, etc.

Educational Exhibit.

The native Industrial School exhibited a number of carpenters' tools, etc., manufactured by the pupils.

The Rev. James Culvert sent a collection of Books in the Fijian language, Illustrated Sacred Cards, Polynesian Gazette, printed on native cloth, etc., and several private individuals exhibited Photographs, Paintings, etc.

CAPE OF GOOD HOPE.

This is the most important British colony in South Africa. Its total area, formerly only about 120,000 square miles of territory, is now about 226,000 square miles, with a population of 340,000 whites and 900,000 colored.

This headland was discovered by Bartholomew Diaz, a Portuguese navigator, in 1846, but no permanent settlement at the Cape was effected by the Portuguese. It was used for the next century and a-half as a port for their ships, and by those of England and Holland as well.

In 1620, a party of Englishmen landed and took possession in the name of James I. but nothing came of this attempt, and it was not until 1652 that the Dutch East India Company took possession of Table Bay.

It was occupied by the English from 1795 to 1803, restored to the Batavian government in the latter year, and re-occupied by the British in 1806, whose possession of the place was ratified by the congress of Vienna in 1815.

It is only within the last seventy years that English colonization has been freely and fairly encouraged in the country. It is now quite prosperous, its exports in 1884 amounting to $35,000,000.

The colony now has 1,603 miles of railway open to traffic, and the total amount expended upon their construction and equipment was $73,000,000. They have also telegraphic lines, and submarine connection with England.

So far back as 1837, the Secretary to the Cape Government wrote a memorandum on the state of its free schools and generally on the state of education in the colony. This gave rise to the appointment of a Superintendent-General of Education, and the establishment of twelve principal schools.

In 1839, primary free schools, and secondary schools with a fee of $20 per annum were established. The teachers were paid by the government. Other schools were added about the same time to provide for the poorer children, chiefly of the colored race.

From that time the Government has been very liberal in aiding by grants from the Treasury, the establishment of schools throughout the colony. At the present time the Government co-operates with each section of the community in promoting education by means of grants in aid from the public revenue. The provisions of the higher and elementary education acts include grants in aid of Universities, the half salaries of teachers in the three grades of Public Schools, the half salaries of superintendents and teachers of District Boarding Schools. Capitation allowances towards the maintenance of indigent scholars, aid towards the salaries of teachers of District Mission Schools, and towards the salaries of teachers of Day Schools among the aborigines and native tribes. Capitation allowances to native apprentices and boys and girls in industrial institutions; assistance in equipping schools with furniture, books, maps, blackboards, scientific apparatus, etc.; also tools for native workshops, and sewing materials where needle-work is taught; aid for training elementary teachers, and aid for art schools.

In 1884 the colony had 1,004 schools of various classes, with 78,037 pupils; there was also five colleges, with 315 students in the University of the Cape of Good Hope which is an examining body.

The amount expended for education in 1884 was about $1,000,000, one-half being, paid by the Government and the other half by local efforts.

The annual cost for instruction per pupil is $15.30; the fees vary from thirty-five cents to eighty cents per month in the country districts, but are much higher in the principal towns.

Educational Exhibit.

There was no exhibit from the Public Schools.

The Art School, Cape Town, sent pupils' work, consisting of Freehand Drawings, Machine Drawings, Building Construction, Sepia Paintings from casts, etc.

The Art School, Grahams' Town, contributed a good collection of Outline and Shading from the round, Oil and Water Color Paintings, etc.

The Art School, Port Elizabeth, sent Freehand Drawings from nature, Geometrical Drawings, Machine Drawings, Isometrical Projections, Building Construction, Drawings from casts, Oil and Water Color Paintings, etc.

The Art School, Witenhage, exhibited Machine Drawings, etc.

In addition, there were excellent Drawings and Designs for Buildings, Maps and Diagrams, Paintings, etc., from private exhibitors.

NATAL.

This colony is situated on the eastern side of South Africa, 800 miles beyond the Cape of Good Hope and facing the Indian Ocean, its area is 24,000 square miles; the total population is 423,000, including 35,000 Europeans, 27,000 Indian coolies and 361,000 Zulu-Kafirs.

Natal was first occupied as a British possession in 1843. Sugar is grown along the coast; it was introduced in 1851, and at the present time they have about 29,000 acres with an annual produce of about 18,000 tons; tea and tobacco are also grown in large quantities; coal is found in great abundance; it has been calculated that the coal fields of the Klip River county will yield over 2,000,000,000 tons.

There are 173 miles of railroad in operation, owned and worked by the Colonial Government.

Provision has been made for a system of education for the colony and the maintenance of Government Public Schools. These Schools are under the control of the Council of Education, consisting of twelve members, five of whom are ex-officio members of the Executive Council; the remainder are nominated by the Governor in Council. There is also connected with this Department a Superintendent of Education.

For Elementary Education there are four Model Primary and seven Primary Schools, distributed through the chief towns.

These Schools have an annual examination, on which depends capitation grants, payable to the teachers, as an incentive to good work, over and above their fixed salaries. There are also about forty Private Schools in receipt of Government grants, and subject to Government supervision.

For higher education there are two High Schools. Three Bursaries, each $200, to the High Schools, for three years, are open each year to competition among boys in the colony. There is also an exhibition of $750 per annum, tenable for four years, given annually, the holders to proceed to the United Kingdom for the term of the exhibition.

The amount voted by the Legislative Council for education in 1885, was $135,000. The fees paid by the pupils attending the Government Schools in 1885, amounted to about $16,000, which is paid into the treasury as general revenue.

The fees at the Primary Schools range from twenty-five cents to one dollar per month, and these are remitted when occasion is shown. During the past year 607 pupils received free education at these Schools.

Educational Exhibit.

The Council of Education exhibited illustrations of the Educational System in Natal. There was also an excellent Map of Natal, showing the positions of European Schools, and several Photographs of Primary and High Schools.

The Scotch Mission Training School at Pietermaritzburg exhibited a collection of pupils' work, done by native children, Desk, Work-box, etc.

Industrial, Agricultural, Geological, Meterological, and other Maps and Charts, were also exhibited by the colony.

ST. HELENA.

This small dependency of the British Empire is 1,200 miles from the nearest point of the African mainland. The whole Island is a huge mass of rock of volcanic origin, varying from 1,500 feet to 2,700 feet above the sea. The total area is about forty-five square miles. Population in 1881, 5,059.

This Island was discovered by the Portuguese in 1502, but was abandoned by that nation in 1600. It then became a bone of contention between the Dutch and English, and was captured by Sir Richard Munden in 1673. It was then granted by charter to the English East India Company, who retained it until 1836, and subsequently transferred it to the Crown for $500,000.

The chief historical interest attaching to St. Helena is derived from the fact that it was the scene of the captivity of the Emperor Napoleon during the last six years of his life, from 1815 to 1821. He died there in 1821, and his body was moved to Paris in 1840.

This Island was formerly well known as a port for homeward bound East Indiamen, but has lost much of its commercial importance since the opening of the Suez Canal. In addition to the loss from the falling off in the visits of shipping, a terrible destruction was caused in 1840, through the introduction of the white ant in some Brazilian timber, out of a broken-up slaver, which inflicted a loss upon the colony of $350,000.

James Town, the seat of Government, has a population of 2,500.

The Commissioners say, in their report, that the great drawback to the prosperity of the Island is, doubtless, the want of efficient and organized labor. The "native," whose wants are easily supplied by a meal of fish and rice, is of a naturally indolent disposition, and not alive to the necessity of working for his daily bread.

There was no School Exhibit from St. Helena, but a large collection of Photographs, Maps, Plans, Water Color Paintings, was contributed by different exhibitors.

ASCENSION.

This small Island is 760 miles from St. Helena, and 900 miles from the west coast of Africa. Its area is thirty-eight square miles, with a population of about 200.

It was discovered by Gallego, a Portuguese, in 1501. It was garrisoned in 1815, by a detachment from St. Helena, and subsequently by a company of marines. During the period of the suppression of the slave trade, it was the head-quarters of the South African Squadron, and stores, barracks, batteries, etc., were built.

Georgetown, the only station, has a fort to protect the town. It is entirely under the admiralty, the Governor being a Captain of the Royal Navy.

The Island is visited by the sea turtles from Christmas to Midsummer, to deposit their eggs in the sand; as many as fifty or sixty are frequently turned of a night, and then removed to ponds or tanks in the town. They weigh from 600 to 800 pounds, and are sold to the shipping for $12.50 each.

The climate is said to be the driest and most salubrious in the world.

There was no Educational Exhibit from this Island, but they exhibited Views and Photographs, and an Admiralty Chart.

TRISTAN D'ACUNHA GROUP.

This group of islands is in the South Atlantic, 1,300 miles from the Cape of Good Hope.

Tristan D'Acunha, like the other Atlantic islands, is of volcanic origin. It was discovered by D'Acunha, a Portuguese, in 1506; it is of circular outline, in the shape of a truncated cone, rising to the height of 7,640 feet above the sea, with an extinct crater at the summit of the mountain. The diameter is about seven miles.

The Island was occupied by a detachment of artillery during the captivity of Napoleon, at St. Helena, and on their withdrawal in 1821, an artilleryman, two seamen, and four whalingmen, remained behind, and became the founders of the present settlement.

In 1867, H.R.H. the Duke of Edinburgh, when Captain of the *Galatea*, visited this Island, and conferred the name of Edinburgh on the settlement.

The population of the colony in 1883 was ninety-three, but this small community sustained a severe loss last year, no less than fifteen brave men losing their lives while endeavoring to assist a ship in distress.

Photographic Views and Charts were exhibited from this Island.

INACCESSIBLE ISLAND.

This Island, which is a great resort for sea-birds, is a high mass of rock, with a table summit nearly square, with sides a mile in length. The highest point is 1,840 feet above the sea.

The outward bound Indiaman, *Blenden Hall*, was wrecked here in 1821, and the crew and passengers rescued and taken to Tristan D'Acunha. Two German officers were also wrecked in 1871, and suffered great hardships until taken off by H. M. S. *Challenger*, in 1873.

The exhibit from this Island consisted of specimens of rocks.

NIGHTINGALE ISLANDS.

A group of three islands. The largest is one mile long and three-quarters of a mile wide, with two peaks, which rise about 1,000 feet above the sea.

The smaller islets, Stoltenhoff and Middle Isle, are large rocks about half a mile in length, 325 and 150 feet in height. A zone of kelp extends a quarter of a mile from the east side of the islands; they are visited by seals and sea-elephants in large numbers.

Specimens of rock from these islands were exhibited.

CEYLON.

The Island of Ceylon is situated south-east of the southern extremity of Hindustan. Its area is about 25,364 square miles, with a population of nearly 3,000,000, but the proportion of Europeans to natives is less than two per 1,000. About 1,700,000 of the population are Buddhists.

This Island is of great historic interest. Sir E. Tennant, formerly Lieut-Governor and Colonial Secretary, says: "There is no island in the world, Great Britain itself not excepted, that has attracted the attention of authors in so many distant ages, and so many different countries, as Ceylon; there is no nation in ancient or modern times possessed of a language or literature the writers of which have not at some time made it their theme."

In the centre of the Island are found the ruins of Pollonnaruwa and Anurádhapura, the latter was the chosen capital of King Panduk Abhaya, 437, B.C., and remained the capital for twelve centuries. Historians write that the outer wall of this city enclosed 250 square miles, and was completed in the first century of the Christian era.

It still contains interesting records in stone and the sacred Bô tree. Major Forbes, in his "Eleven years in Ceylon," states than in the reign of King Devànampiya Tissa, 307, B. C., Anurádhapura received the collar-bone of the Gautama Buddha, his begging-dish filled with relics and a branch of the Bô tree, under which he attained Buddahood."

This relic of 2,200 years ago still flourishes, and is believed to be the oldest living tree of which there is any authentic record. It is held sacred throughout the Buddhist world, and is the goal of many a long pilgrimage. Even the fallen leaves are treasured by the pilgrims, and carried to distant lands.

The Portuguese were the first European settlers in Ceylon. From early in the 16th to the middle of the 17th centuries they held continuous possession. From 1656 to 1796 the Dutch governed the maritime provinces of the Island, the Central or Kandyan provinces remaining under their native rules. In 1796 the last remaining stronghold of the Dutch at Colombo capitulated to the English, and the Island became part of the British possessions in the eastern seas.

Colombo is now the capital, with a population of nearly 120,000.

Ceylon is celebrated for its plumbago; upwards of 240,000 persons are employed in mining and shipping plumbago. In 1882 upwards of 240,000 cwt. were exported. Over one-half of this quantity raised is exported to the United States for the manufacture of pencils, crucibles, etc.*

The manufacture of salt is a Government monopoly, and produces a profit, from $400,000 to $500,000 per annum.

The pearl fishing, though uncertain, is still, in favorable years, a valuable addition to the revenue. The same primitive system of gathering the oysters exists as in ancient times; every oyster is gathered by the hand of the diver, no dredger or implement is allowed to be used. The Government take as royalty, two-thirds of the oysters thus gathered, which are sold by auction at the close of each days fishing. In the last successful fishery, the Government share realized about $300,000.

At present the most important industry is planting coffee in the hill districts. In 1874-5 the export of coffee was valued at $25,000,000. Tea is also largely cultivated. Although the Singhalese are mainly an agricultural race employed in tilling the soil, their exhibits of agricultural implements were of a very primitive style. The Singhalese plough of to day is a counterpart of the implement used two thousand years ago.

Educational Exhibit.

The Department of Education exhibited Singhalese Maps of Ceylon, Europe and Asia, prepared for vernacular schools. The Department also publish books for the English, Anglo-Vernacular and Vernacular Schools.

A large number of Buddhist old books were exhibited. These are composed of leaves of a palm tree; the writing is effected with an iron stylus, and the leaf washed over with an equivalent for ink, which, when the rest of the leaf is cleaned, remains on the letters. The whole of the leaves are then pierced and strung together and bound with a board on each side.

The Government of Ceylon sent a series of large Kandyan Paintings, which were used as a frieze round the walls of the Court.

Private exhibitors also sent Paintings, Photographs, Botanical Drawings, etc.

*The Canadian Plumbago and its products, as exhibited at the Colonial Exposition, took the highest awards at the Philadelphia and Paris Exhibitions for pencils and crucibles, and it is to be hoped that this important trade will soon be in the hands of Canadians.

MAURITIUS.

Mauritius, or Isle of France, is a beautiful and fertile island situated on the Indian Ocean. It is the largest British possession in the African seas. Its area, including the dependencies of Rodrigues, Seychelles, Amirante Isles, Chagos, etc., is about 708 square miles, with a population of about 360,000.

The island was taken by the British from the French in 1810. The greater part of the population consists of colored races, chiefly Hindu. They are largely engaged in the culture of coffee, sugar-cane, rice, etc.

Port Louis is the capital, with a population of about 70,000.

It consists of alternate hills and valleys, the highest point being nearly 3,000 feet above the sea.

The Executive Committee sent a large collection of Maps, Photography, Botanical Specimens, etc., but there was no educational exhibit.

SEYCHELLES.

The Seychelles or Mahe Archipelago, consists of 30 small isles with a population of about 7,000. These islands are situated to the north of Mauritius on the Indian Ocean.

Originally discovered by the Portuguese, they were, after occupation by the French, ceded to England in 1814, and now form one of Her Majesty possessions. Although little known to fame, they are said to be abundant in fertility and natural beauty.

The exhibit consisted chiefly of sketches of fruits, flowers and other objects, and a variety of natural history specimens.

STRAITS SETTLEMENTS AND PROTECTED MALAY STATES.

Straits Settlements.

The Colony of the Straits Settlement, as defined by letters patent under the Great Seal of the United Kingdom, dated the 17th of June, 1885, consists of the Island of Singapore, the Town and Province of Malacca, the Territory and Islands of Dindings, the Islands of Penang, Province Wellesley, and their dependencies.

Singapore is situated at the extremity of the Malay Peninsula, and it contains an area of 206 square miles. It is the most important commercial station of this region. The town of Singapore, with a population of 139,200, is now the seat of government.

Malacca is the largest as well as the oldest of the Straits Settlement. It has an area of 659 square miles. The town of Malacca has about 5,000 inhabitants. Malacca was ceded to England by a treaty with Holland in 1824, in exchange for Bencoolen, in Sumatra, with an agreement that England would not form any settlements in Sumatra, nor the Netherlands in the Malay Peninsula.

The *Dindings* were ceded to the Colony by Treaty in 1874. The total area of these islands is about 200 square miles.

Penang was ceded to England in 1785 by the Rajah of Kedah,—it was the seat of Government of the Straits Settlement until 1832. The total area is 10,759 miles.

Wellesley was ceded to England by the Rajah in 1800, in order to enable the authorities to put down the prevailing piracy which played havoc amongst the European merchantmen. Its area is 207 square miles.

The total population of the settlements in 1881, was 423,834, the proportion of Europeans was about 3,000, natives of India 12,000, and the remainder Malay and Chinese, about equally divided.

British intercourse has extended with this region for over 300 years. It was formerly in the possession of the Dutch, and subsequently from 1827 to 1867 was an Indian dependency. It was then transferred by Act of Parliament to the Colonial Office.

It is a Crown Colony. The Council is administered by a Governor appointed by the Crown for a term of six years.

There are English teaching schools in the settlements, some supported by Government, others by endowments and voluntary contributions.

In Singapore they have eight English teaching schools, and a special school for Chinese boys. In Penang there are ten English teaching schools, and in Malacca five schools.

The attendance at these schools in 1884 was 4,098; the fees paid by pupils varying from 25 cents to one dollar per month.

Malay vernacular education is provided throughout the Colony in schools supported from the public revenue, with the exception of a small fee of 4 cents per month for each pupil.

Protected States.

In 1874, the three Native States, Perak, Selangor and Shujai Ujong, were taken under protection by Great Britain. They are governed by their native rulers, acting with the advice and assistance of an officer styled the British President, who is appointed by Her Majesty's Government, and is directly subject to the Governor of the Straits Settlements. Each state has its staff of European and native officers.

Perak has an area of 7,949 square miles, with a population of 118,000 persons.

Selangor occupies an area of about 3,000 square miles. The population amounts to 46,568 persons.

Shujai Ujong has an area of 660 square miles, with a population of about 14,000 persons.

Educational Exhibit.

The Free Schools at Penang exhibited Maps drawn by Chinese boys.

Private exhibitors sent Malay-English and English-Malay books, and a large collection of publications printed in Singapore, Albums of Scenery, Photographs, etc.

The Ethnological department was fully represented by Models of Chinese Temples, and other buildings, Native Craft, Implements, etc., also a collection illustrating the daily life of the inhabitants of the Cocos, or Kieling Islands.

HONG KONG.

The Island of Hong Kong is separated from the mainland of China by Victoria Harbour, Ly-se-moon pass, and Tathong Channel. It has a circumference of 27 miles and an area of 30 square miles, with a population of about 160,000, of which 130,000 are Chinese.

It was ceded to Great Britain, together with the Harbour and Islets in January, 1841, and the cession was confirmed by the Treaty of Nanking, in August, 1842. Hong Kong and its dependencies were erected into "the Colony of Hong Kong" by Letters-patent bearing date the 5th April, 1843.

The administration of the Colonies is at present in the hands of the Governor, with an Executive Council of six official members and a Legislative Council of six official and five unofficial members.

The chief town and centre of the Colonial Government is Victoria, situated on the north side of the island. It has a magnificent harbour of 4 miles long and from 2 to 3 miles wide, of sufficient depth for the largest vessels. There is excellent dock accommodation for the largest ships.

Hong Kong is in constant connection by means of steamers, with Europe, America and Australia, also with India and the coast ports.

The Government supports a Central School, the building for which being inadequate for its wants, will shortly be replaced by a new building now in course of erection, to be called Victoria College. In addition they have the Hong Kong Public School or St

Paul's College, under the direction of the Bishop of the Colony and a c c
Joseph's College, under the direction of the Bishop of Acantho and the Christian Brethren. There are also schools supported by different missionary bodies, including mission vernacular schools for girls. In addition there are French, Italian and Spanish Convents.

Educational Exhibit.

The Inspector of schools in Hong Kong sent an exhibit consisting of educational books, photographs of students at work, school materials, and models of desks, chairs, etc., used by the pupils.

The Italian Convent and the French Convent, each exhibited collections of needlework done by Chinese children. Private exhibitors sent maps, photographs, etc., and there was a great variety of models illustrating the manners and customs of the people.

BRITISH NORTH BORNEO.

This is one of the latest additions to the large number of British Colonies distributed throughout the globe.

The territory of British North Borneo includes the whole northern portion of the great Island of Borneo, situated in the region of the Malay or East Indian Archipelago. The area of British North Borneo, including some small isles, is 31,000 square miles.

It was founded by the North Borneo Company, under a Royal Charter, bearing date the 1st November, 1881. The cession of territory by the Sultans of Brunei and Sulu, on conditions of the payment of an annual tribute, took place in December, 1877, and January, 1878. This company secured, as it is by a Royal Charter, has its possessions, which are now a part of the British Empire, protected by the British flag from all aggression or encroachment on the part of any alien or foreign power.

The Government is administered by a Governor, assisted by a Council and by a Colonial Secretary and President, and the mode of Government of a British Crown Colony is adhered to as far as practicable.

The greater portion of British North Borneo is covered with dense forests, containing trees up to ten feet in diameter and of great height, many of them being over 100 feet to the first branch. There are about 78 known kinds of forest trees; some of these are very valuable. The woods are used for furniture, house building, engineering, etc.; one variety, Billian, is in great demand in China and the Straits Settlements, for wharf piles, etc., as its specific gravity is so great that it sinks in water and is very hard and durable, and perfectly proof against the 'Teredo' or sea worm.

It is quite probable that the immense trade now done in the exports of the woods of North America to China and Australia, may be diverted to British North Borneo, as these countries are only about 1,100 miles distant.

As the European population is very small, provision has not yet been made for education in this settlement.

The exhibit consisted chiefly of natural products, including woods, rattans, gutta percha, india rubber, vegetable tallow, gum, gold, coal, etc.

BRITISH GUIANA.

This Colony is situated in the north-east of South America; its area is computed at 76,000 square miles.

The first colonists were the Dutch, who settled on the Pomeron Coast in 1580. In 1781 the British captured all the possessions of Holland in South America. They were subsequently surrendered to the French, regained by the Dutch, who in 1796 yielded them to the British, in whose hands they have remained, with the exception of a brief period in 1802-3, up to the present time.

The population of British Guiana in 1885 was about 270,000, exclusive of 900 troops in garrison and seamen in the forts.

The Aboriginal Indians are scattered through the interior. The only dress an Indian usually wears is a strip of cotton bound tightly round their loins and secured by a cord tied round the waist, with a string of beads round his neck, and a crown made of bright feathers. The women are as scantily attired as the men, but wear more ornaments. Some of these Indians work upon the timber grants, but they are chiefly occupied in fishing, hunting, etc. They are clever in constructing boats and canoes, specimens of which were to be seen at the exhibition.

Georgetown is the metropolis and chief port of British Guiana. It has beautiful public buildings, law courts, Catholic cathedral, hospital, market, etc.; it is also supplied with gas, waterworks, tramways, and a railway. There are two newspapers published daily. There is also a Portuguese paper.

The Colony is divided into eighteen parishes, under the charge of the clergy of the Church of England or Church of Scotland. The total expenditure of the Colony in 1885, on account of the clergy and missionaries was over $100,000.

About $125,000 was expended for education. There are 177 schools receiving Government aid, including Church of England, Church of Scotland, Church of Rome, Wesleyan London Missionary, Congregational and Estate Schools. The principal school is Queen's College, which is a Government institution.

There was no Educational Exhibit from this Colony, but private exhibitors sent a collection of maps, photographs, and water-color paintings. In addition the Commissioner had a very interesting Ethnological collection, consisting of weapons and other articles in use among the native Indians.

WEST INDIES.

The numerous islands of this region are embraced under three divisions—the Greater Antilles, the Lesser Antilles, or Windward and Leeward Islands, and the Bahama Islands.

Combined the West Indies represent an area of 100,000 square miles, inhabited by 1,500,000 British subjects.

In order to illustrate as thoroughly as possible the history of the colonies discovered by Columbus, in 1492, a number of pictures, historical relics, books and engravings, were exhibited on the West Indian gallery. In this collection we notice a series of oil paintings of the Kings and Queens of England who are connected with the history of the West Indies; also ancient portraits of Columbus, and the Diego Ribero Map, loaned by the S. Congregation of Propaganda Fidei, Rome, by permission of His Holiness, Pope Leo XIV. This map was executed by Diego Ribero in 1529, and is reported to be the earliest complete map of the world in existence. It measures 7 feet by 3 feet, and is on parchment.

Jamaica.

This island was discovered by Columbus in 1494. It was under Spanish rule until conquered by the English during the administration of Oliver Cromwell.

The total area of Jamaica is about 4,200 square miles, and the population, according to the last census, was 580,000. Of these are whites, 14,432; colored, 109,946; blacks, 444,186, the remainder being Coolies and Chinese.

Jamaica is divided into three counties; Surrey to the east, Middlesex in the centre, and Cornwall to the west, The eastern part is mountainous, a range known as the Blue Mountains, varying in height from 5,000 to 6,000 feet above the level of the sea, traversing from east to west. The coasts contain numerous safe and excellent harbors, over thirty of which are capable of affording shelter to the largest vessels. The finest is Port Royal, or Kingston Harbor, 6 miles long by 2 miles wide.

The principal towns are Kingston, with a population of 40,000 inhabitants, and Spanish Town, the seat of Government, population about 8,000.

Prince William, Duke of Clarence, visited Jamaica in 1782, and was the first member of the Royal Family who ever landed on its shores. Since then H. R. H. Prince Alfred, Duke of Edinburgh, was entertained in 1861, and the two sons of the Prince of Wales in 1880.

The most remarkable event that has happened during the present century in connection with this island is the emancipation of slaves in 1833.

There was no Educational Exhibit from Jamaica, and the only exhibits of an educational character were photographs of public buildings by the Jamaica Institute; etchings, etc., from the Women's Self Help Society; and books and natural history specimens from private contributors.

Trinidad.

Trinidad, discovered by Columbus in 1496, is the largest of the islands in the Caribbean Sea known as the Lesser Antilles. The total area of the island is 1,754 square miles; population by last census, (1851) was 153,128.

Settled by the Spanish in 1588, Trinidad has been the scene of sanguinary conflict between them and the French, and the latter and the English, finally resting with the English in 1797.

Colonel (afterwards the famous Sir Thomas) Picton, was appointed the first English Governor. Trinidad was finally ceded to Great Britain by the Treaty of Amiens, but not without great opposition on the part of Napoleon, then First Consul, who supposed from its geographical position, it would command the trade of the great rivers of South America.

During the first five years after its capture, over $1,000,000 worth of articles of British manufacture were sold annually by the merchants of Trinidad to the traders from Venezuela, and a far larger trade was carried on clandestinely, as is proved by the fact that Colonel Picton reported to the Secretary of State that Spanish launches annually carried away articles of British manufacture to the value of $8,000,000; subsequently, however, Trinidad was fated to be looked upon by British statesmen merely as a sugar-producing colony.

Although the colony has always been immediately under the Crown, the Commissioner states that remnants of the old Spanish law still remain; names of places and estates are Spanish still, the leading residents bear French and Spanish names, and the society of the capital includes a complete French circle even now.

The capital is Port of Spain, with a population of 32,000. Trinidad has also the Port of San Fernando, which is connected by a railway recently completed by the Government.

Photograph views of public buildings, etc., were exhibited, also oil and water-color paintings, and a collection of 235 specimens of woods with English, French, Spanish and scientific names attached.

Barbados.

Barbados is the most windward of the Caribbean Islands; its total area is 166 square miles, with a total population of 171,860—whites, 16,054; coloured, 155,806.

First owned by the Portugese at an unknown date; it was named by them "Los Barbados," from the number of bearded fig-trees or banyans which were found growing there.

This is one of the oldest British colonies; in the year 1605 the "Olive," an English vessel, touched at the island and landed some men, who inscribed on a tree "James, King of England, and of this island."

James I. made a grant of this island to the Earl of Marlborough, and the first English Governor was appointed in 1625. The island has never been severed from England. The principal town and port is Bridgetown, with about 21,000 inhabitants.

The chief product of the island is sugar. At first the sugar-cane was only cultivated for the purpose of brewing a refreshing drink. In 1640 a Dutchman from Brazil taught

the science of allowing the cane to ripen and of boiling the juice. At the same time the planters learnt to distil rum, called at first "kill-devil."

Out of 106,470 acres, an area of 100,000 acres is now devoted to canes, the remainder being taken up with roads, buildings, etc.

The colony may now be described as possessing representative institutions, but the Crown has a veto on legislature, and retains the appointment and control of public officers. The Government consists of a Governor, Executive Council, and a Legislative Council, appointed by the Queen, and a House of Assembly having twenty-four members elected annually on the basis of a very low franchise.

There is a large number of Elementary Schools on the island, supported by school fees and Government aid. Also many Higher schools, endowed and aided by the State, all of the Church of England. There are also Moravian and Wesleyan schools. The Codrington College, founded in the year 1710, is connected with the University of Durham, and its students are eligible for all the degrees.

Barbados is the only place in the West Indies where a university education can be obtained.

Some paintings and photographs were exhibited, but no educational appliances.

THE WINDWARD ISLANDS.

The Windward Islands includes the islands of Grenada, St. Lucia, St. Vincent, and Tobago, containing an aggregate of 622 square miles. They are presided over by a Governor, or Chief, who resides in Grenada, the seat of Government, the other islands having a resident Administrator. Each island has its separate legislature, laws, and tariff.

Grenada.

This island is situated in the Caribbean Sea. It was discovered by Columbus in 1498, and was inhabited by a people of war-like habits called Caribs. It is about 21 miles in length, and 12 in breadth, with a population of 46,425. In 1650 the Island was taken possession of by Du Parquet, a Frenchman, who eventually got rid of the natives; after several battles their extermination was effected by driving the last remnant of the Caribs, about fifty, into the sea. The place from which they threw themselves into the sea was called *Le Morne des Sauteurs* (the Hole of the Leapers), a name it has retained to the present day. Du Parquet transferred possession of the island to the Count de Cerillac, in 1656, for 30,000 crowns. Subsequently it was sold to the French West Indian Company, whose charter being abolished in 1674, it became vested in the Crown of France.

In 1762 Grenada surrendered on capitulation to Great Britain, and was ceded to that power by the Treaty of Paris in 1763. It was recaptured by the French in 1799, and restored to the British Government at the general pacification in 1783.

The present form of local Government in Grenada is that known as the Crown Colony system. The Governor, who is appointed by the Queen, is Governor-in-Chief of the other islands composing the Windward Group.

The chief produce of the island is cocoa.

The principal town is St. George, with a population of about 4,000. It was originally built by the French, who named it Port Royal. It has a large bay, which is estimated to be able to afford shelter to 1,000 ships of 400 tons each.

Education was formerly much neglected, but of late years they have a good system of Elementary schools, which is working with satisfaction. In 1885 a Grammar School was established by some private persons which has since been endowed by the Government, and is said to promise great results.

There was no educational exhibit from Grenada.

St. Vincent.

St. Vincent is the most English of the group of the Windward Islands; it has an area of about 140 square miles. The capital of the island is Kingstown, with about 6,0 00 inhabitants.

St. Vincent was not finally conferred to England till 1795. In the early part of the 18th century the French and English began to treat it as neutral, both disliking, more or less, the task of dealing with the Caribs. It is one of the two remaining islands, the other being Dominica, where the last traces of the Caribs, or old savages of the West Indies, remain. There are 192 Caribs and half Caribs in St. Vincent; they are now a well-behaved race, their old character for ferocity and treachery having been tamed down by the march of civilization.

St. Vincent formerly exported coffee, cocoa, indigo, and tobacco, but the cultivation of sugar gradually superseded that of other products.

St. Vincent is celebrated for its arrowroot.

There was no school exhibit, but excellent models and ethnographical collections representative of the island were exhibited.

Tobago.

Tobago is situated about 75 miles from Grenada, and 20 miles from Trinidad. Its total area is 114 square miles.

Tobago was visited by British navigators in 1580, when the English flag was first planted on the island; it was then uninhabited. In 1625 some Englishmen from Barbados attempted to form a settlement, but most of them were killed by the Indians who then occupied the island. The history of this island has been a very eventful one.

It has been on different occasions a possession of the Dutch, French, and English, and several sanguinary battles have taken place for its conquest. Eventually it fell into the hands of the English, and by the Treaty of Paris in 1762 was surrendered to England. In 1764 it became a legally constituted colony, and the first Lieut.-Governor was appointed.

In 1778 an armament was fitted out by the American States, then in their early days of independence, having for its object the conquest of Tobago. A short engagement ensued, in which the British were successful.

In 1781 Tobago was conquered by the French; in 1793 it was re-taken by the British. By the Treaty of Amiens in 1802 it was surrendered to the French. In 1803 war having broken out again between England and France, Tobago became once more a bone of contention. A British naval and military force invaded the island, and the French Governor capitulated on condition that his garrison should be allowed to return to France. From this period Tobago has remained in the indisputed possession of the English, having been ceded to Great Britain in 1814 by the Treaty of Paris.

Tobago has made very little progress, and the population has not increased 4,000 during thirty years.

They depend upon one mail a month for communication with the outside world, and have no cable connection with other countries. Out of 73,313 acres which it contains, only about 10,000 are under cultivation; some of the best land in the colony is allowed to lie unproductive for the want of roads to the interior of the island.

They had no Educational Exhibit.

St. Lucia.

St. Lucia, twenty-five miles to the north-east of St. Vincent, has a total area of 243 square miles, with a population of over 40,000. The island is almost entirely covered with high mountains, among which is the Souffriére, a volcano in occasional activity.

The first attempt at colonization was by some English settlers in 1639; in the following year the Caribs massacred many of them and drove the rest away. The French next took possession of the island; in 1663 it was captured by the British and was ceded to the French in 1667.

At the Peace of Paris, in 1763, the Earl of Chatham, by the advice of Admiral Rodney, refused to cede it to France, and on the renewal of hostilities, it was one of the first points of attack, and fell once more to Great Britain, but was restored to France at the Peace of Versailles. In 1803 it was again re-taken by Great Britain, and since that time has continued under British rule.

The chief staple of the island is sugar, but attention is now being turned to the cultivation of cocoa, tobaccos and spices.

The capital is Castries, with about 4,550 inhabitants.

They have fifteen elementary schools distributed among the ten towns and villages of the island. These schools are of two classes; those managed by the Roman Catholics and those managed by the Trustees of the Mico Charity, which are undenominational: they each have about the same number of pupils.

The Convents in Castries and Soufriére have excellent schools for over 700 girls.

There was no educational exhibit from St. Lucia.

THE LEEWARD ISLANDS.

The Leeward Islands are the most northerly of the groups which constitute the Lesser Antilles.

Politically, they are a federation, that is to say, an aggregation of independent governments and legislatures, which, for certain purposes, have delegated their powers to one central and partially supreme government.

Antigua.

Antigua has an area of 108 square miles; the population in 1881 was 34,964.

This island was discovered by Columbus in 1493. It was at various times in the possession of the Spanish, French and British, whose settlers were exposed to frequent attacks from the Caribs.

Antigua is the seat of the general government of the Leeward Islands. It has a local government administered by the Governor of the Leeward Islands, assisted by an Executive council, and a legislature composed of twenty-four members, twelve of whom are nominees of the Crown, and twelve are elected by the people.

The capital is St. John's.

The chief product is sugar; it is said that the introduction of the steam plough has conferred advantages that cannot be over-estimated, as by its use lands which have long lain waste are being re-claimed and brought into cultivation.

Educational Exhibit.

Pupils' work from Cedar Hall Moravian School. Samples of Needlework from Lebanon Moravian School, Map of West Indies, collection of Books, old Antigua Newspapers, etc.

St. Christopher and Nevis.

This presidency is composed of two islands, divided by a strait from two to three miles wide.

Nevis was united to St. Christopher in 1883.

St. Christopher, commonly known as St. Kitts, lies nearly west of Antigua, it has an area of 68 square miles with about 2,000 inhabitants.

This island was discovered by Columbus in 1493; it was then densely crowded with Caribs. A settlement was founded in 1623. St. Christopher is believed to be the mother colony of the English and French settlements in the Caribbean Sea.

In 1627 the English and French agreed to divide the island between them. In 1689 the French took entire possession of the island. It was re-taken by the English in 1690,

restored to the French in 1697, again captured by the British in 1702, and finally ceded to the British Crown by the Peace of Utrecht in 1713. Subsequently the island became part of the general government of the Leeward Islands.

The capital is Basseterre, the seat of government, with a population of about 7,500.

There are 18,507 acres of land under cultivation; the chief products are sugar, coffee and cocoa; from 1878 to 1882 they exported 1,114,269 barrels (of 100 pounds) sugar, 2,224,723 gallons of molasses, and 287,284 gallons of rum. They have also three large salt marshes which produce about 14,000 pounds of salt annually.

As there are no harbors in St. Kitts or Nevis, the produce has to be conveyed to the shipping places in cattle waggons and carts drawn by mules and horses.

Nevis lies immediately to the south-east of St. Christopher; its area is about fifty square miles, it formerly had a population of 20,000, which is now reduced to less than 12,000.

It was settled by the English in 1625 and became one of the chief slave markets of the West Indies. The emancipation of the slaves had a most crushing effect on Nevis and caused a complete collapse of credit. It is said that the condition of the laborer was then miserable in the extreme, and his wages scarcely averaged ten cents a day. At the present time, laborers earn sixty-six cents per day. The owners of estates are wealthy, and financially Nevis now ranks amongst the most prosperous of West India Islands. Its principal product is sugar.

It is of historical interest as the place where Lord Nelson was married, and passed many years of his life.

The chief town is Charlestown.

There was no educational exhibit from these islands, but a very fair collection of Pottery, Vases made from wood, Shell work, Bead work, Carib implements, and what was of considerable interest, the Register of St. John's, Nevis, containing a record of the marriage of Horatio Nelson and Mrs. Nisbet, on March 11th, 1787.

Dominica.

This is one of the largest of the West India Islands; it contains 291 square miles. The total population at the census of 1881 was 28,211, of whom 27,204 were natives of the island. There were 309 Caribs, of whom 173 were considered to be actual Caribs by descent, without any admixture of negro blood.

Its mountains are next in height to those of Jamaica, but even to the top they are densely clothed with foliage. It is said that from peak to shore the island is a mass of virgin soil and unopened forest.

Dominica was granted to the Earl of Carlisle in 1627; by the treaty signed at Aix-la-Chapelle in 1748, it was stipulated between the English and French that Dominica should remain neutral. In 1776 it became by conquest a dependency of England. Commissioners were sent out for the purpose of surveying and selling the lands capable of cultivation, and the quantity sold yielded to the British Crown the sum of over $1,500,000.

In 1805 the French landed at Roseau, the principal town, which was accidently set on fire, and the Governor was obliged to capitulate, paying the enemy $60,000 to quit. Since this period the island has not known war.

Only 20,000 acres are under cultivation. There remain at least 140,000 acres available for the cultivation of tropical and sub-tropical plants.

The principal products are sugar, cocoa, lime-juice and fruit. Within the past few years an export trade to New York has been established in oranges, which grow almost wild throughout the island.

Dominica is not in a flourishing condition; its trade is small, finances at a low ebb, and houses and roads in a bad condition.

Although there are forests containing valuable woods for building and other purposes, they are only exported in small quantities.

It has been recommended that Her Majesty's Government assist the colonists in constructing roads through the island, so as to open up the interior for the cultivation of staple products.

There was no school exhibit, but there were collections of Models, ancient Carib Implements, photographs of Scenery, etc.

Montserrat.

This island is situated about twenty-six miles south-east of Antigua, its area is about thirty-five square miles, population 11,000.

It was discovered by Columbus in 1493, and settled by the English in 1632, but the French took it in 1664. It was restored to England in 1668, when it was granted by charter a constitution of its own, with a Legislative Council and House of Assembly. It capitulated to the French in 1782, but was again restored to England in 1784, in whose possession it has since remained.

Under the Federal Act, Montserrat is a Presidency, forming part of the colony of the Leeward Islands. The President is the Resident District Magistrate and a Commissioner of the Supreme Court. The Courts of Queen's Bench and Common Pleas are merged into "The Supreme Court" with its three judges going on circuit, and holding the court alternately in each island two or three times a year.

The island consists of a series of rocky hills, with fertile valleys between. The principal product is sugar, but of late years the growth of lime trees and the manufacture of lime-juice has given Montserrat a better known position in commerce.

The population is rapidly increasing, which is attributed to the salubrity of the climate, and to the government provisions of medical attendance and medicines free for all children of laborers under ten years, and all old persons over sixty.

The Commissioner says: "A very wide system of education has also been granted to the children of laborers since emancipation, embracing one in eight of the population from 1837 to 1856, and one in eleven since the new Acts came into operation, by which grants in aid of education have been made from the public purse, and have reached in some years to five per cent. of the entire revenue. An enquiry into the working of these Acts whereby the cost of education per head has been almost quadrupled, has recently been made by a Government Commissioner, the result being that education has been proved to have advanced under them, but they stand condemned in the matters of expenditure."

The principal town in this island is Plymouth.

There was no educational exhibit.

Virgin Islands.

The Virgin Islands consist of a cluster of rocks to the westward of Porto Rico. Those of them which belong to Great Britain are Tortola, Virgin Gorda and Anegada. The total area is about fifty square miles, with 5,500 inhabitants.

Tortola has an area of twenty-six square miles, consisting entirely of hills, which rise about 1,600 feet above the sea. Roadtown is the capital of the group.

Virgin Gorda is about ten square miles in extent, chiefly hilly and barren in its eastern part.

Anegada is a low-lying coast island, with an area of about fourteen square miles.

For purposes of administration, the group has for a century belonged to the Leeward Islands, having its own legislature.

In 1867, a fearful hurricane destroyed about two-thirds of the houses, including the churches, school-houses, etc. In 1871, the islands again suffered from a hurricane, but not so severely. These islands are not in a prosperous condition.

There was no school exhibit.

BRITISH HONDURAS.

British Honduras, or Belize, is the only British dependency in the Southern portion of North America. It is bounded on the north by Yucatan, on the east by the Bay of Honduras, on the south by Guatemala, and on the west by a straight line drawn from the

rapids of Gracias a Dios, on the river Sarstoon, to Garbutt's Falls, on the river Belize, and thence northward to the Mexican frontier. Total area, 7,562 square miles.

The coast was discovered by Columbus in 1502. The settlement was originally called Belize. In 1638, some Englishmen were shipwrecked and settled here.

So far back as 1671 it was considered a place of importance, as the Governor of Jamaica reported to the King that, "it increased His Majesty's customs and the national commerce more than any of His Majesty's colonies." This is accounted for by the fact that logwood, which was then its staple product, sold for $500 per ton; it is now sold so low as $10 to $15 per ton.

In 1763, a treaty was entered into with Spain, notwithstanding which several battles took place during the next twenty-five years between the English and Spaniards. In 1798, it became English by right of conquest.

Although one of the older settlements, it is one of the youngest colonies. It was not made a colony until 1862, when a Lieutenant-Governor was appointed, under the Governor in Chief at Jamaica.

In 1879, a Governor was appointed. The form of Government is now that of a Crown colony, in which the Crown has the entire control of legislation, while the administration is carried on by officers under control of the Home Government.

The industries of this colony are wood-cutting, growing and manufacturing sugar, cultivation of coffee, tobacco, fruit, etc. The average export is 3,000,000 feet of mahogany, and 17,000 tons of logwood. The cultivation of fruit for the American market is now carried on in consequence of steam communication having been established with New Orleans. The capital is Belize.

The schools in the colony are generally denominational, established and superintended by the clergy of some religious body. They have one Church of England, one Presbyterian, seven Roman Catholic, thirteen Wesleyan, one Baptist and two private schools.

Teachers are granted certificates according to their merits, and receive Government aid under certain conditions.

There was no educational display, but good collections of natural history specimens, photographs, etc., were exhibited.

THE BAHAMAS.

The Bahamas consist of an aggregation of twenty-nine islands, 661 bays, and 2,387 small islets or reefs, which stretch from the northern coast of St. Domingo, to the eastern coast of Florida, a distance of over 600 miles. The principal island is New Providence, which contains the capital, Nassau, with a population of 13,000, and is twenty-seven miles long and seven miles wide. The other principal islands are:—Grand Bahama, Eleuthera, Andros, Abaco, Long Island, San Salvador, Rum Bay, Imaqua, Exuma, Ragged Island, Crooked Island, Berry Island and Harbor Island.

The population, according to the last statistical report, is 44,000, of whom 11,000 were white, and the remainder descendants of liberated Africans.

The Bahamas were discovered by Columbus in 1492. They were inhabited by a hospitable people of the Caribee tribe who believed in a God—a great spirit—and in a future state of reward and punishment. A few years later the followers of Columbus, who had settled in Hispaniola, needed hands to work their mines, and invented a diabolical plot to induce the natives of the Bahamas to accompany them to Hispaniola. They were told that if they would embark upon the Spanish ship and go with them, ere a day and night were passed they would embrace their departed friends, and dwell with them eternally. About 50,000 natives left the island and died in torment, being overworked, scourged and starved by their ferocious task masters.

In 1512, the Bahamas were visited by Ponce de Leon, who went there in search of the fountain of eternal youth. The islands remained almost uninhabited for nearly a century, although they still continued to be Spanish property, having been bestowed, with the whole of the new world, upon Ferdinand and Isabella by Pope Alexander VI.

In 1578, Queen Elizabeth bestowed on Sir Humphrey Gilbert all lands and countries that he might discover, that were not already taken possession of by some Christian and friendly power. As Spain was not a friendly power, Sir Gilbert annexed these islands. Subsequently, repeated attacks were made by the Spaniards. The first British Governor was appointed in 1670.

The present Government is based on the British constitution. They have a Governor, Executive Council of nine members, a Legislative Council of nine members appointed by the Crown, and a House of Assembly of twenty-nine members.

The principal exports are sponges, turtle, coral and shells.

They are now well supplied with public schools, also an art school, reading-room and library, scientific societies, etc.

In 1861, the census gave 8,506 as able to read and write, out of a total population of 35,287. This is less than twenty-five per cent., but they say it is the reverse now as there is scarcely a child over seven years of age who cannot read or write.

Educational Exhibit.

Carved ornaments from the Nassau School of Art, collection of Natural History, etc.

WEST AFRICAN SETTLEMENTS.

These settlements consist of Sierra Leone and Gambia. By an order in council, 26th January, 1876, they were united into one Government, to be called the West African settlement.

Sierra Leone.

Sierra Leone is a small settlement at the mouth of the Rokelle or Sierra Leone river. It has an area of 468 square miles, with a population of over 37,000, of whom only 129 are white. The climate is very deadly to European residents. It was ceded to Great Britain in 1787 by the native chiefs, and was made a residence for freed slaves from the United States and West Indies. A large island called Sherboro was added to it in 1862, when slavery was abolished.

The settlement also includes the Isles de Los; and by treaty 1876, Her Majesty has the right to collect customs duties along the coast between Sierra Leone and Sherboro.

The government is administered by a Governor and Executive Council, and a Legislative Council of five official and four non-official members.

The principal exports are cocoa-nuts, gums, hides, india rubber, etc.

The principal town and seat of Government is Freetown.

There was no educational exhibit, but the native industries, including embroidered garments, decorative gold and ivory work, etc., showed excellent workmanship, and considerable talent in artistic decoration.

Gambia.

The settlement of Gambia lies 500 miles north of Sierra Leone. It has an area of twenty-one square miles, and population of 14,190.

It was made a British colony in 1588, when Queen Elizabeth granted a patent to some English merchants. The slave trade was extensively carried on until emancipation.

The River Gambia empties into the Atlantic. At the mouth of the river is Bathurst the principal town. There are three other posts or trading stations along the banks of the river, viz., British Combo, Barra, and McCarthy's Island.

This settlement is now under the Government of Sierra Leone.

The trade is chiefly in exporting hides, rice, timber, gold-dust, ivory, etc.

Educational Exhibit.

There was a collection of educational books in the native language, consisting of grammars, catechisms, dictionaries, etc. They also exhibited some leather work ornamented with excellent geometrical designs, carvings in wood, and natural history specimens. Amongst the natural products were the Verach seeds, which are used by the natives as candles, one nut being placed after another in such a manner that the flame is transmitted from seed to seed so as to give an uninterrupted light for a considerable period.

THE GOLD COAST COLONY.

The name Gold Coast is given to that portion of the shores of the Gulf of Guinea between the rivers Asini and Volta. It has a total area of 16,620 square miles, with a population of 520,000.

The Gold Coast has been occupied as a British settlement since 1672, when the Royal African Company was formed, which built several forts along the coast. These forts were transferred to the Crown in 1821.

This was soon followed by the first Ashanti war, and on January 24th, 1824, the Governor, Sir Charles McCarthy, was defeated and slain, and his head carried to Coomassie. This was ended by a victory over the Ashantis near Accra, in 1827.

After this the country was again placed in the hands of a mercantile body, which continued until the second Ashanti war in 1863.

These events were followed by a re-arrangement of possessions between the English and the Dutch, which occasioned so much trouble to the latter power, that, in 1871, Holland abandoned to Great Britain all its rights on the Coast. This convention not being approved of by the King of Ashanti, he invaded the British Protectorate in 1873, and so commenced the third and last Ashanti war. Troops were sent out under Sir Garnet Wolseley, who captured Coomassie on the 4th February, 1874.

After this war the settlements on the Gold Coast and at Lagos were by Charter united under one constitution as the Gold Coast Colony, which continued until the present year, when Lagos has again been formed into a separate colony.

There was no Educational Exhibit, but the general exhibit, consisting of textile fabrics, gold and silver ornaments, etc., of native workmanship, showed a considerable knowledge of artistic design. This exhibit included the gold ornaments which were paid by the Ashantis to the British Government as a portion of the indemnity claimed at the close of the war in 1874; also the Golden Fetish Axe, which was sent to the Queen by the King of Ashanti in 1881 as a token of peace and submission.

LAGOS.

Lagos, or Niger Territory, is situated on the Bight of Benin. This colony includes Badagry on the west, and adjoining Dahomey; Lagos Island, lying among Lagoons in the centre; and Palma and Leckie on the east. The population in 1881 was 75,270, (only 94 whites).

Lagos was formerly the headquarters of the slave trade, and was ceded to Great Britain in 1861, by King Docemo, who received a pension of $5,000 per annum until his death, which took place in 1885. At first the settlements of Lagos were formed into a separate Government. In 1866 they were amalgamated with the West African settlements, under the Government of Sierra Leone. In 1874 they were amalgamated with Gold Coast Colony, and in 1886 were separated from the Gold Coast, with a constitution of their own.

The chief exports are palm oil, indigo, ivory, cotton, etc.

Educational Exhibit.

There were no exhibits from schools, but several of the general exhibits were real art examples. A collection of incised and *repousse* brass utensils showed great beauty of design; some ivory tusks were artistically ornamented, and the textile fabrics, including weaving and embroidery, were beautifully ornamented. A collection of photographs was included in their exhibits, also two illuminated Korans and a Mahometan MS., which is a good example of early illuminative art.

MALTA.

Malta is situated in the very centre of the Mediterranean, about 58 miles from Sicily and about 180 from the mainland of Africa. Its area is 95 square miles, with a population of 150,000.

Malta is of great historical interest; the Phœnicians settled here B. C. 1519. It was subsequently under the Carthaginians and Romans, and was granted by the Emperor Charles V., early in the 16th century, to the Order of the Knights of St. John of Jerusalem. The Knights of Malta held possession of this island for more than three centuries, until the final dispersion of the Order.

During the past century the spirit of British industry began to show its power by erecting public works and increasing the productive energy of the colony.

The principal products are cotton, potatoes, corn, fruit, and honey. In its manufactures are three specialties, viz., stone work, lace, and jewellery.

An Art School, recently established in Valetta, the chief town, has been the means of introducing modern designs in lace work, so that this trade has now become a most important branch of manufacture, employing 4,500 women and girls, with a revenue of about $250,000 per annum.

There are 173 public and private schools, colleges and ecclesiastical institutes in Malta. The number of pupils attending the schools show a marked and continual increase. In 1842 there were only 3,833 pupils; in 1881 the number had increased to 12,390, exclusive of adults who attended evening and Sunday School classes.

Educational Exhibit.

The Orphan Schools at Floriana and Cospicua exhibited specimens of inlaying and fret work in wood and ivory. The Sisters of the Good Shepherd sent examples of Maltese lace, point lace, embroideries, etc., and private exhibitors sent specimens of bookbinding and typography, also sacred and secular music.

CYPRUS.

Cyprus is the most easterly island in the Mediterranean; its area is 3,723 square miles, with a population of 186,173, sub-divided as follows:—Greek Church, 137,631; Mohammedan, 45,458; various religions, 3,084.

Cyprus is of great historical antiquity, and is referred to in the Book of Genesis under the name of "Kittim." It was conquered by Thothmes III. of Egypt, about B.C. 1600, and became subject to Assyria B.C. 725. It was annexed to the Roman Empire B.C. 57. It was the birth-place of Barnabas the Apostle, and was ruled by him and St. Paul in the early days of the Christian Church.

In ancient times Cyprus is reported to have had a population of 3,000,000. In 1191 Richard Cœur de Lion, King of England, when on his way to the Holy Land, conquered

the island and sold it to the Knights Templars for a sum equal to $1,600,000. In 1571 Cyprus was conquered by the Turks, and remained a part of the Ottoman Empire until 1877, when it was ceded by the Sultan to Queen Victoria, in consideration of an annual payment equivalent to the surplus revenues which it had yielded to the Ottoman treasury in the preceding five years. Consequently the island of Cyprus is burdened annually with a payment due to the Sublime Porte which is estimated at $464,000. As the excess of revenue is not sufficient to pay this amount, the balance has to be made good by the British Government.

The products of the soil are one of the principal sources of revenue. Their grain, although it ranks amongst the first in the world, is depreciated in value from the defective system of threshing*, which is the same as was followed in patriarchal times. The grain, when brought from the field, is spread on a level piece of hard ground, and a flat piece of wood, having small pieces of flint inserted into its lower surface, is drawn over it. In this process small stones are detached from the ground, and of about the same size as the grain; no ordinary fanning machine can separate them.

Considerable improvement, however, has been made in the general condition of the island since the British took possession in 1878.

This island has for many centuries suffered severely from the ravages of locusts. During the past four years $335,000 has been expended in reducing their numbers.

Administration—Cyprus is administered under the Colonial office by a High Commissioner, assisted by a Legislative Council, composed of 18 members, 6 of whom are appointed by the Crown, and 12 are elected by the people.

Education is now in a progressive state. The grant for education in 1885 was $15,000. The number of schools in operation was 236, viz., 165 Greek, 63 Moslem, 6 Roman Catholic, 1 Armenian, and 1 Jewish.

In addition there are 12 schools for children kept by Moslem dames at their own houses.

Educational Exhibit.

Their exhibit included some excellent physical and other maps and diagrams, pictures and photographs, official reports, Turkish books, collections of zoology and ethnography, etc.

FALKLAND ISLANDS.

The Falkland Islands, consisting of the east and west Falkland, and about 100 other smaller islands, are situated in the South Atlantic Ocean; area about 7,600 square miles; population, 1,553.

These islands were discovered by Davis in 1592. In 1763 they were taken possession of by France. Subsequently they were held by the Spaniards until 1771, when they were for a time given up to Great Britain. In 1820 the Republic of Buenos Ayres established a settlement on these islands, which was destroyed by the Americans in 1831. In 1833 they were taken possession of by the British Government for the protection of the whale fishery.

The Government is administered by a Governor, aided by an Executive and Legislative Council, the members of both councils being appointed by the Crown.

Stanley is the chief town and seat of Government.

Wild cattle and horses are found in large numbers on these islands, and their chief exports consist of hides, horns, hoofs, bones and tallow.

With the exception of a photograph their exhibit consisted of natural products.

* Photographs of similar threshing machines can be seen at the Educational Museum.

THE EMPIRE OF INDIA.

India is the central and most important peninsula of Southern Asia. It has an area of 1,500,000 square miles, with a population of about 250,000,000.

From the time of the expedition of Alexander the Great to the Punjab, in the year 330, down to 1600, settlements in India have been established at different periods by Mahometans, Tartars, Portuguese, Dutch, French, and English.

British India is about three-fifths of this vast country. The remainder is divided between different states, which are more or less dependent upon British authority. The British Empire in India commenced with the incorporation of the English East India Company, in 1600. This company existed for two and a-half centuries, having all the provinces of British India under its rule until the mutiny of 1857.

In 1858, at a grand *Durbar* held at Allahabad, Lord Canning announced that the Queen of England had assumed the entire Government of India. In 1877, at another more magnificent *Durbar*, held by Lord Lytton, at Delhi, and attended by all the great feudatory princes and chiefs, Her Majesty was proclaimed Empress of India.

Nearly a million square miles of territory, with a population of about 200,000,000, are now under British administration.

The last possession in India annexed by England was Upper Burmah, an area of about 192,000 square miles, with a population of from 3,000,000 to 4,000,000. War was declared by King Theebaw, in November, 1885. The King was captured at Mandalay during the same month, and the following proclamation was issued on 1st January, 1886, by the Viceroy and Governor-General of India.

"By command of the Queen-Empress, it is hereby notified that the territories formerly governed by King Theebaw, will no longer be under his rule, but become part of Her Majesty's dominions, and will, during Her Majesty's pleasure, be administered by such officers as the Viceroy and Governor-General of India may from time to time appoint.

(Signed) DUFFERIN."

India is governed as follows :—

Ajmere, Berar, Coorg, Andaman Islands, (Port Blair), under the Viceroy as Governor-General, who is Governor of the whole of India; Bengal (Lieutenant-Governor); N. W. Provinces and Oudh (Lieutenant-Governor); Punjab (Lieutenant-Governor); Central Provinces (Chief Commissioner); British Burmah (Chief Commissioner); Assam (Chief Commissioner); Madras (Governor); Bombay (Governor); Burmah (annexed 1886.)

The Lieutenant-Governors, Chief Commissioners, etc., are appointed by the Viceroy, subject to the approval of the Crown.

The trade of India is of vast importance; the total exports and imports amount together to over $750,000,000 annually.

The Government of India took a great interest in the Colonial and Indian Exhibition. At the first meeting of the Commissioners, in March, 1885, the Earl of Kimberley, Secretary of State for India, said, "There is, perhaps, nothing more desirable for India, than that its products and industries should be well known in this country, although we have much more to learn from them than to teach them. Their beautiful manufactures, which they have produced for so many ages, have proved that there is a knowledge of many branches of art, which it would be a thousand pities should be diminished under our rule."

The collections were made with the assistance of the Governments of Presidencies and Provinces, and of the Rulers of native States, and formed three divisions. I. The Art ware Courts. II. The Economic Court. III. The Administrative Court.

The Art exhibits were divided with reference to locality, and not with reference to classification; this was done for the purpose of showing the character of the Art manufactures in the different Provinces of India.

Two sections the whole length of the Main Exhibition Building were occupied with these exhibits, and a very ingenious plan was adopted for showing one of their surviving branches of decorative art. It is the custom, even at the present day, for men of wealth to decorate their houses, and those of the gods they worship, with carvings in wood and stone. Each of the Provinces had one or more separate alcoves in which to exhibit their goods. The fronts of these alcoves consisted of carved screens, raised on arches, thus forming double façades the entire length of the building.

I.—ART-WARE COURTS.

The Art-ware Courts are entered through a carved gateway, sent by His Highness the Maharajah of Jeypore. The gateway is surmounted by a drum-house, such as are usually found over the entrances to royal residences or temples, in which musicians play. In the kiosk on the top were arranged figures representing musicians with their instruments.

Rajputana Court.

Twenty states forming the agency known by this name, under the Governor-General, exhibited in this Court. The Rajputana States represents an area of 130,000 square miles, with a population of ten millions. They stretch from the India agency to Sindh, and from Gujerat to the Punjab.

The Jeypore screen in this Court may be referred to as an illustration of the native art talent of Indian workmen. The only instructions issued to the wood-carvers were, that as great a variety of patterns should be employed as possible, the ornaments to be purely Indian. The men draw rough outlines with a pencil or even the graver, and each carver does what is right in his own eyes, subject to the approval of the master workman.

The Commissioner remarks that "the city of Jeypore is in all matters of art the most active of the Rajputana States. The local School of Art, under the patronage of the enlightened Rajah, has endeavoured to improve the indigenous art of the town by attending to details, so as to correct the habit of merely repeating the designs which have been handed down from their forefathers."

In this Court were specimens of gold and silver plate, lacquered-ware, inlaid work, glazed pottery, and textile fabrics. In addition the Jeypore School of Art sent a collection of articles in brass, copper, and mixed materials, which displayed excellence of work.

Central India Court.

This is a numerous group of States also placed under the charge of the Governor-General.

The area is 75,000 square miles, with a population of over nine millions.

The principal screen in this Court is intended to illustrate Buddhist and Hindoo sculpture, as found in Central India. The collection included stone-carving, jewellery, ancient and modern arms, lacquer-work, textile fabrics and embroideries.

Bombay Court.

This Presidency has an area of 124,134 square miles, and a population of sixteen and a-quarter millions. The native states add to these totals 73,000 square miles, and seven millions of inhabitants. Besides these, the State of Baroda, which contains 8,570 square miles, and a population of 2,185,000, was represented.

The design for the screen in this Court was made by the Superintendent of the Bombay School of Art. In the centre isle of the chief India Court was the Baroda Pigeon House; an admirably carved structure, which from its lofty position, was used by visitors

as a point at which friends missing each other in the crowds might meet during the exhibition. This collection embraced wood-carving, inlaid work, pottery, metal work, lacquered-ware, horn work, ivory work, and gold and silver work, etc. *Repoussé* work in silver is a specialty in this Province.

Bengal Court.

The Bengal Territory, governed by the Lieutenant-Governor of Bengal, includes Bengal proper, Behar, Orissa, and Chota Nagpur, containing an area of 150,588 square miles (exclusive of Sonderbands), and a population of 66,691,546—nearly one-third of the population of British India. In addition, the native states in connection with Bengal have an area of 36,664 square miles, and a population of nearly thirty-five millions.

The screens in this Court were intended to illustrate by means of *papier mache* castings, the styles of architecture of Hindoo and Mohammedan buildings in Bengal proper. The northern screen represents the Temple of Krishna, built between 1704 and 1722. The entire surface of this building is covered with terra-cotta reliefs, representing figure subjects taken from the daily life of the people. Casts, made in a mixture of *papier mache* and plaster of Paris, were made from those reliefs, and being coloured to match the originals, gave a good representation of the general effect of the ancient temple.

The collection included carving, sculpture and clay models, jewellery, inlaid work, lacquered-wares, textile fabrics, etc.; also specimens of carving in wood and repoussé copper electro-plated panels after Hindoo ornamental designs, from the Calcutta Government School of Art.

Nepal Court.

Nepal stretches from the southern ranges of the Himalayas, twenty miles into the "plain," and 700 miles along the Northern India frontier.

The area is about 54,000 square miles, and the population is supposed to be about two millions.

The Art-ware of this little-known territory was represented with examples of the special arts and industries which belong almost exclusively to the Newars, whom the Ghurkhas conquered about 1768.

In this Court was an illustration of one of the degrading customs of this country, which is not open to European tourists; it was a saddle used in the households of wealthy persons. These saddles are strapped on the backs of servants for carrying their masters and mistresses up or down stairs, or from room to room.

North-West Provinces and Oudh Court.

These Provinces and Oudh, forming together the upper portion of the great valley of the Ganges, have an area of 106,111 square miles, with a population of forty-four millions.

The seat of Government has been transferred from Agra to Allahabad.

One of the screens in this Court had a row of pillars from Agra, inlaid with precious stones, and presented by the Government of India to the national collection at South Kensington.

In this Court the general exhibits were similar to the preceding, but amongst the textile manufactures might be noticed a peculiarity not seen in the other Courts. The weavers interweave at the time of manufacture any design that may be suggested to them. Verses and sentences are most common, and these include passages from the Koran and Vedas, and others from Dr. Watts' songs and hymns, etc.

The Punjab Court.

This Province, including the territory surrounding Delhi, has an area of 106,632 square miles, and a population of nearly nineteen millions. There are also 39 native states in connection with the Province, comprising an area of 36,000 square miles and two million inhabitants.

In addition to the specimens of carving, jewellery, etc., this Court contained furniture, and excellent examples of textiles, including cotton and woollen fabrics, silks, and embroideries.

Kashmir Court.

The State of Kashmir extends from the plains of the Punjab across the central range of the Himalayas, towards Chinese Tartary and Tibet. The valley of Kashmir forms but a small portion of the whole area, which is estimated at 810,000 square miles, with a population of 1,500,000. The Maharajah presents annually, by way of tribute to his Suzeran, 1 horse, 12 goats, and three pairs of the celebrated Kashmir shawls.

In this Court are specimens of Kashmir *papier maché* work, carving, textiles, etc. Kashmir shawls were also exhibited, but it is said that this manufacture is dying out. The revenue from this source was formerly from $2,000,000 to $3,000,000 per annum, but within the past ten years the demand has decreased so much that it is stated that the art of weaving the finest shawls will probably be extinct in fifteen or twenty years, unless the Government takes steps to preserve the trade.

Central Provinces Court.

The Central Provinces, of which Nagpur is the headquarters, have an area of about 85,000 square miles, with a population of about 10,000,000. There are also fifteen native states, total area 29,000 square miles, with a population of nearly 2,000,000.

This Court had exhibits of wood, and stone carving, jewellery, textile fabrics, silk, etc.

Assam Court.

The Province of Assam includes the Upper Brahmaputra Valley, or Assam Proper. The area is computed at 46,000 square miles, total population about 5,000,000.

Assam is chiefly famous for its tea plantations. The art ware exhibits were not numerous in this Court.

Burmah Court.

British Burmah has an area of 87,220 square miles; before the recent annexation, its population was 3,736,771.

This Court contained a large collection of art work in wood and metals, textiles, etc.

Madras Court.

Madras has an area of 139,900 square miles, with a population of 30,688,500. The city of Madras, the third greatest in India, is entirely of English origin, and dates from the building of the British factory in 1639.

The screen for this Court was designed by the Superintendent of the Madras School of Art, and executed under his direction by Madras carpenters and carvers.

The Madras School of Art exhibited a candlestick and a *lota* in solid silver, made in the school; a collection of water vessels of brass, ornamented with silver and copper flowers; a carved window and native doorway, the work of one of the pupils, and a large variety of specimens of glazed and unglazed pottery, altogether the work of the school. The forms and colors of the old Madurra pottery are carefully followed.

Embroideries and laces were also exhibited by the Hobart School of Mahommedan girls.

Hyderabad Court.

Hyderabad, or the Dominion of the Nizam, has an area of 81,807 square miles, and a population of nearly 10,000,000. The Nizam is the chief Mahommedan native ruler, and a descendant of the Mighal Nizam-ul-Mulkh, (Regulator of the Empire).

The principal exhibits in this Court were manufactures of the ornamental metal ware of Bidan, which consisted of over one hundred different articles used for domestic purposes. The Commissioners say, "No dowry is considered complete among the better class of Mahommedans unless a complete set of *bidri* ware, from bed-legs to a spittoon, is included. The high prices often render it necessary for the father of a family to begin his collection years before his daughter is marriageable."

Mysore and Coorg Court.

Mysore and Coorg are continuous Hill States. Mysore is a native state ruled over by a descendant of the Hindoo chieftain from whom Hyder Ali usurped it. The total area is over 25,000 square miles, with a population of over 4,000,000.

Coorg is under the direct administration of the Governor-General. Its area is 1,600 square miles, with a population of about 180,000.

The exhibits in this Court consisted of sculpture, lacquer-ware, jewellery and textile fabrics.

THE ECONOMIC, OR IMPERIAL COURT.

This Court contained the raw products and rough manufactures which illustrate the resources of India, also minerals and ores, and geological maps, and models of Bengal farmers' homesteads and agricultural implements.

THE ADMINISTRATIVE COURT.

This Court included 1, Department of Revenue and Agriculture; 2, Department of Finance and Commerce; 3, Home Department, including Education; 4, Public Works Department; 5, Legislative Department; 6, Foreign Department; 7, Military and Marine Department.

Educational Exhibit.

The Home Department exhibited illustrations of the means and appliances employed in the schools under their jurisdiction. A model of an indigenous school in Bombay was also exhibited.

In 1881, there were under instruction in India 2,879,571 males, and 155,268 females; out of the entire population only 7,646,712 males and 277,207 females could read and write. The number given in the statistics for 1881 who could not read or write was 217,171,284.

In 1882–3, the number of schools inspected was 111,237, with 2,790,061 pupils.

THE IMPERIAL INSTITUTE.

The proposition to establish a permanent institute representing the arts, manufactures and commerce of the colonies and India, has been under discussion in England for several years.

In 1874-5, the Chambers of Commerce and the Associated Chambers of Commerce of the United Kingdom, memoralized Her Majesty's Government on the subject of establishing an Imperial Museum.

In 1876, the *Times* fully discussed this question, giving an estimated cost of site, cost of buildings and cost of maintenance. That year was considered to be opportune, as the Centennial Exhibition was being held, it being supposed that arrangements might be made at its close for transferring the colonial exhibits from Philadelphia to the Imperial Museum.

The amount proposed to be raised was $2,000,000 for site and buildings; in addition, the estimates for maintenance amounted to $100,000 per annum. The promoters of the scheme were of opinion that this expenditure should be shared equally between England, and India and the colonies.

When the matter was publicly debated, it was considered that there would be no difficulty in raising one-half of the required expenditure from India and the colonies, but as regarded England, the question arose whether it was advisable to spend so much money for a museum, as they were then erecting the Natural History Museum, at a cost of $1,760,000, and, in addition, the grants for maintenance of museums and kindred institutes, amounted to over $1,000,000 per annum.

There is no doubt that the principal reason the Imperial Museum was not proceeded with in 1876, was because the Government did not vote the necessary funds.

After the close of the Paris Exhibition in 1878, efforts were again made to renew the project, but from various reasons they fell through.

The present seems to be a very fitting time for the establishment of such an Institution; the success of the Colonial and Indian Exhibition, and the approaching Jubilee of the Queen, were no doubt sufficient inducements for His Royal Highness the Prince of Wales to take a personal interest in endeavoring to establish an Imperial Institute, and for that purpose the Prince addressed the following letter to the Lord Mayor of London:—

MARLBOROUGH HOUSE.
Pall-Mall, S.W., Sept. 13.

DEAR LORD MAYOR,—My attention has been frequently called to the general anxiety that is felt to commemorate in some special manner the approaching Jubilee of Her Majesty's reign.

It appears to me that no more suitable memorial could be suggested than an Institute which should represent the Arts, Manufactures and Commerce of the Queen's Colonial and Indian Empire.

Such an Institution would, it seems to me, be singularly appropriate to the occasion, for it would illustrate the progress already made during Her Majesty's reign in the Colonial and Indian Dominions, while it would record year by year the development of the Empire in the arts of civilization.

It would thus be deeply interesting to Her Majesty's subjects, both within and beyond these islands, and would tend to stimulate emigration to those British territories where it is required, to expand the trade between the different British communities, and to draw closer the bonds which unite the Empire.

It would be at once a Museum, an Exhibition, and the proper locality for the discussion of Colonial and Indian subjects.

That public attention has already been forcibly directed to these questions is sufficiently proved by the remarkable success which is attending the Colonial and Indian Exhibition at South Kensington, and I confidently anticipate that arrangements may be made whereby the more important collections, which have so largely contributed to this success, will be placed at the disposal of the Institution.

I have much satisfaction in addressing this letter to your lordship as Chief Magistrate of the capital of the Empire, and to invite your co-operation in the formation of this Imperial Institute of the Colonies and India, as the memorial of Her Majesty's Jubilee by her subjects.

Should your lordship concur in this proposal, and be willing to open a fund at the Mansion House, I would suggest that the contributions received be vested in a body of trustees, whom the Sovereign would be asked to nominate, and I would further suggest that the institution should be under the permanent presidency of the Heir apparent to the Throne.

I remain, dear Lord Mayor,
Yours truly,

(Signed), ALBERT EDWARD P.

The Right Honorable the Lord Mayor.

In reply to this communication, the Lord Mayor replied as follows :—

The Mansion House,
London, E.C., Sept. 17.

Sir,—I have the honor to acknowledge the receipt of your Royal Highness's letter of the 13th inst. and, in reply, to express the great pleasure it will afford me to give the heartiest co-operation and aid in the formation of the proposed Imperial Institute of the Colonies and India as the memorial of Her Majesty's Jubilee by her subjects.

Your Royal Highness truly states that general anxiety is felt to commemorate in some special manner the approaching jubilee of Her Majesty's reign. There will, I am sure, be a universal desire to give expression in a suitable and, if possible, adequate way to the deep attachment, veneration, and loyalty which the Queen's subjects in all parts of her vast dominions entertain for a Sovereign whose long and illustrious reign has been productive, under Providence, of many blessings to her people, and been rendered memorable by the striking progress in civilization and prosperity developed throughout the Empire.

Difficult as it may be to signalize in a commensurate way the feelings which are thus naturally emphasized at the approach of the Jubilee of Her Majesty's reign, I am convinced that the proposal which your Royal Highness indicates, and which has the support of your influence, will be considered singularly appropriate.

It will, therefore, give me much satisfaction to open a fund at the Mansion House for the receipt of contributions, as suggested by your Royal Highness.

I have the honor to remain, Sir,
With the greatest respect,
Your Royal Highness' most dutiful and most obedient servant,

(Signed), JOHN STAPLES, Lord Mayor.

His Royal Highness the Prince of Wales, K.G.

So far as commemorating the jubilee of Her Majesty's reign is concerned, the proposal of His Royal Highness met with the approval of all classes, but England made very little response in contributing funds, although the colonies were quite willing to do so.

The British press discussed the scheme very fully, and while they all agreed on the desirability of founding an institute which, in addition to commemorating Her Majesty's jubilee, would also show the immense growth of the British Empire, they recommended that the site of the building should be decided upon, and the trustees appointed before subscriptions should be asked for. Some persons argued that the Institute should be made representative of the Empire ; that there should be a genuine representation of the colonial feeling which has not always been the case with Crown appointments.

It was also rumored that British Manufacturers were not disposed to contribute to the support of an institute which would be opposed to their interests, by the introduction of various branches of manufacture in competition with their own.

This gave rise to the appointment of a Royal Commission, to report on the best method for conducting and Imperial Institute. The Commission recommended that Great Britain should also be represented in the Imperial Institute. This is only fair, for those who contribute towards a public enterprise shouid certainly share any advantages to be derived therefrom.

The present proposition is, that the foundation stone of an Imperial Institute shall be laid on the day of Her Majesty's Jubilee. The site has not yet been decided upon, but there is every probability that the new buildings will be erected on the grounds where the Colonial and Indian Exhibition was held last year. The old buildings have already been removed."

The question now arises, what benefit will Canada derive from an Imperial Institute?

1. It is to be premised that each of the colonies will retain its own individuality, by having sufficent accommodation for a museum and offices; such an arrangement would be advantageous by concentrating all the colonial offices now dispersed over London.

2. It is considered that it would be more economical, as the expenditure for rents would be less, and the museum would be invaluable to the agents of the respective colonies in their dealings with commercial men or intending immigrants.

3. The museum would be a permanent advertisement of Canadian products and trade collections. Hitherto, Canada has only had an opportunity of exhibiting her products and manufactures to Europeans about once in each decade, this is doubtless of considerable value, but it is well known that private individuals who have amassed colossal fortunes in trade by advertising, have done so by constant and continual advertising. The same rule which applies in this case to the private individual is applicable to a colony. This can be proved by the action of Australia.

Prior to the Centennial Exhibition of 1876, some of the colonies of Australia voted money for the establishment of a colonial museum in London, and part of their permanent collection was exhibited at Philadelphia. Not knowing the date of the establishment of this museum I will take the year 1874. On comparing the value of exports from Australia to Great Britain, I find that the exports for the year 1884 amounted to over seven millions of pounds sterling ($35,000,000) more than the exports amounted to in 1874.

We will now see what Canada has done during the same period. In 1874, the exports to Great Britain amounted to $45,003,882; in 1884, the exports amounted to only $43,736,227; a decrease of $1,267,655.

It is therefore evident that permanent exhibitions are of great value to a colony, and if Canada is to find a larger market for her products and manufactures, we must not be satisfied with arousing temporary attention to our goods, as was done at the Colonial Exhibition, but must endeavor to increase our trade by keeping the importance of our forests, mines and fisheries, and our trade manufactures permanently before the people of other nations.

(No. 24).

Report of the University of Toronto for the year 1885-6. *(Not printed).*

(No. 25).

Report of the Inspector of the Elgin House of Industry and Refuge for the year ending 31st October, 1886. *(Not printed).*

(No. 26.)

Statement of the affairs of the Toronto General Trusts Company. *(Not printed).*

(No. 27).

Return of the Municipal Council of the Township of Yarmouth, of money borrowed during the year 1886, under the Act respecting the investments in Tile Drainage. *(Not printed).*

RETURN

Of copies of Advertisements, Tenders, Specifications, Contract, etc., in connection with the erection of the proposed Legislative and Departmental Buildings of Ontario. Presented to the Legislative Assembly.

By command,

A. S. HARDY,
Secretary.

Provincial Secretary's Office,
Toronto, March 7th, 1887.

RETURN

OF COPIES OF ALL ADVERTISEMENTS INVITING TENDERS FOR THE EXCAVATIONS, AND STONE-MASONS', AND BRICKLAYERS' WORKS, ETC., CONNECTED WITH THE PROPOSED NEW LEGISLATIVE AND DEPARTMENTAL BUILDINGS, AND OF THE TENDERS RECEIVED THEREFOR IN THE YEAR 1886, WITH COPIES OF CORRESPONDENCE RELATING THERETO, AND COPIES OF THE SPECIFICATIONS AND CONTRACT AS EXECUTED FOR THE SAME; ALSO, ADVERTISEMENTS "NOTICE TO CONTRACTORS" FOR "TENDERS FOR PARLIAMENT BUILDINGS" ACCORDING TO PLANS OF (1) MESSRS. GORDON AND HELLIWELL; (2) MESSRS. DARLING AND CURRY; AND SCHEDULE OF TENDERS RECEIVED THEREUNDER IN THE YEAR 1882.

NOTICE TO CONTRACTORS.

Sealed Tenders, addressed to the undersigned, and endorsed, "Tenders for the Masonry and Bricklayers' Works, etc., of Parliament Buildings," will be received at this Department until twelve of the clock, noon, on Thursday, the second day of September next, for the excavating, and the masonry and bricklayers' works, labour and materials, and certain other works, etc., in connection therewith, required for and in the erection and construction of the proposed new Parliament and Departmental Buildings for the Province of Ontario.

Printed forms of tender can be obtained at this Department, and persons tendering are specially notified that they will not be entitled to have their tenders considered unless the same are made on and in compliance with these printed forms, signed with the actual signature of every person tendering (including each member of the firm), followed by his post-office address, and with all blanks in the forms properly filled up.

Each tender must be accompanied by an accepted bank cheque, payable to the order of the Commissioner of Public Works for Ontario, for the sum of eight thousand dollars, which will be forfeited if the party tendering declines or fails to enter into a contract based upon such tender, when called upon to do so. Where the party's tender is not accepted the cheque will be returned.

For the due fulfilment of the contract, satisfactory security will be required on real estate, or by the deposit of money, public or municipal securities or bank stocks, to the amount of five per cent. on the bulk sum, to become payable under the contract, of which five per cent., the amount of the accepted cheque accompanying the tender, will be considered a part.

To each tender must be attached the actual signatures of at least two responsible and solvent persons, residents of Ontario, willing to become sureties for the carrying out of these conditions, and the due fulfilment and performance of the contract in all particulars.

Printed copies of the specifications can be obtained on application at the Department.

The Department will not be bound to accept the lowest or any tender.

C. F. FRASER,
Commissioner, etc.

Department of Public Works for Ontario,
Toronto, 11th August, 1886.

TENDER

For the Excavating and the Masonry and Bricklayers' Works, labour and materials, and certain other works, etc., in connection therewith, required for and in the erection and construction of the proposed new Parliament and Departmental Buildings for the Province of Ontario, according to the plans and specifications therefor prepared by Richard A. Waite, Esq., Architect.

SEPTEMBER 2nd, 1886.

To the Commissioner of Public Works for Ontario :

SIR,—It is hereby proposed and agreed by the undersigned to do, perform, furnish and supply, and in all respects fully complete the entire Excavating and Masonry and Bricklayers' Works, labour and materials required for or in the erection and construction of the proposed new Parliament and Departmental Buildings for the Province of Ontario, in accordance and compliance with the plans and specifications prepared therefor by Richard A. Waite, Esq., Architect, and all works, matters and things of whatsoever nature, character, or kind mentioned, included or intended by, in or under said plans and specifications, for the sum of seven hundred and seventy-two thousand seven hundred dollars ($772,700.00).

Accompanying this tender is an accepted bank cheque payable to the order of the Honourable the Commissioner of Public Works for Ontario, for the sum of Eight Thousand Dollars ; and it is understood and agreed that said cheque and the amount thereof will stand and be forfeited to the said Commissioner of Public Works, for the use of the Province of Ontario, if the undersigned shall decline or fail to enter into a contract based upon this tender when called upon so to do.

For the due fulfilment of any such contract the undersigned will give satisfactory security on real estate, or by the deposit of money, public or municipal securities, or bank stocks to the amount of five per cent. on the bulk sum to become payable under such contract (the amount of the above mentioned cheque to be taken as part of said security).

Submitted with this tender are marked samples of the building stone, cement, lime, sand, cut stone and brick, proposed to be used in performing the work.

The undersigned proposes and agrees to fully and entirely complete the works above mentioned within thirty-six months from the date on which notification is given the undersigned of the acceptance of this tender by the Commissioner of Public Works.

The proposed sureties for the carrying out of these conditions, and for the due fulfilment and performance of any such contract, are the persons whose actual and *bona fide* signatures are written to the proposal in that behalf hereunder attached.

Your obedient, etc.,

BROWN & LOVE,
Toronto.

We, the undersigned, whose actual signatures, places of residence and occupations are hereunder written and attached, propose and agree to become sureties for the due fulfilment and performance in all particulars of any contract entered into in pursuance of the foregoing tender, and for the carrying out of all conditions referred to therein.

Dated this second day of September, A.D. 1886.

WM. BOOTH, Toronto,
Brick Manufacturer.

R. R. CARROLL, Toronto,
Merchant.

TENDER

For the Excavating and the Masonry and Bricklayers' Works, labour and materials, and certain other works, etc., in connection therewith, required for and in the erection and construction of the proposed new Parliament and Departmental Buildings for the Province of Ontario, according to the plans and specifications therefor prepared by Richard A. Waite, Esq., Architect.

SEPTEMBER 2ND, 1886.

To the Commissioner of Public Works for Ontario :

SIR,—It is hereby proposed and agreed by the undersigned to do, perform, furnish and supply, and in all respects fully complete the entire Excavating and Masonry and Bricklayers' Works, labour and materials required for or in the erection and construction of the proposed new Parliament and Departmental Buildings for the Province of Ontario, in accordance and compliance with the plans and specifications prepared therefor by Richard A. Waite, Esq., Architect, and all works, matters and things of whatsoever nature, character, or kind mentioned, included or intended by, in or under said plans and specifications, for the sum of eight hundred and nine thousand dollars ($809,000.00).

Accompanying this tender is an accepted bank cheque payable to the order of the Honourable the Commissioner of Public Works for Ontario, for the sum of Eight Thousand Dollars ; and it is understood and agreed that said cheque and the amount thereof will stand and be forfeited to the said Commissioner of Public Works, for the use of the Province of Ontario, if the undersigned shall decline or fail to enter into a contract based upon this tender when called upon so to do.

For the due fulfilment of any such contract the undersigned will give satisfactory security on real estate, or by the deposit of money, public or municipal securities, or bank stocks to the amount of five per cent. on the bulk sum to become payable under such contract (the amount of the above mentioned cheque to be taken as part of said security).

Submitted with this tender are marked samples of the building stone, cement, lime, sand, cut stone and brick, proposed to be used in performing the work, in Credit Valley stone.

The undersigned proposes and agrees to fully and entirely complete the works above mentioned within thirty-six months from the date on which notification is given the undersigned of the acceptance of this tender by the Commissioner of Public Works.

The proposed sureties for the carrying out of these conditions, and for the due fulfilment and performance of any such contract, are the persons whose actual and *bona fide* signatures are written to the proposal in that behalf hereunder attached.

Your obedient, etc.,

LIONEL YORKE,
Builder, Toronto.

We, the undersigned, whose actual signatures, places of residence and occupations are hereunder written and attached, propose and agree to become sureties for the due fulfilment and performance in all particulars of any contract entered into in pursuance of the foregoing tender, and for the carrying out of all conditions referred to therein.

Dated this second day of September, A.D. 1886.

R. J. CARROLL,
350 Spadina Avenue, Toronto,
Builder Supplies.

J. L. FABIAN,
Gentleman, 405 Parliament Street,
Toronto.

TENDER

For the Excavating and the Masonry and Bricklayers' Works, labour and materials, and certain other works, etc., in connection therewith, required for and in the erection and construction of the proposed new Parliament and Departmental Buildings for the Province of Ontario, according to the plans and specifications therefor prepared by Richard A. Waite, Esq., Architect.

SEPTEMBER 2ND, 1886.

To the Commissioner of Public Works for Ontario:

SIR,—It is hereby proposed and agreed by the undersigned to do, perform, furnish and supply, and in all respects fully complete the entire Excavating and Masonry and Bricklayers' Works, labour and materials required for or in the erection and construction of the proposed new Parliament and Departmental Buildings for the Province of Ontario, in accordance and compliance with the plans and specifications prepared therefor by Richard A. Waite, Esq., Architect, and all works, matters and things of whatsoever nature, character, or kind mentioned, included or intended by, in or under said plans and specifications, for the sum of nine hundred and fifty thousand two hundred and seventy-four dollars and eighty cents.

Accompanying this tender is an accepted bank cheque payable to the order of the Honourable the Commissioner of Public Works for Ontario, for the sum of eight thousand dollars; and it is understood and agreed that said cheque and the amount thereof will stand and be forfeited to the said Commissioner of Public Works, for the use of the Province of Ontario, if the undersigned shall decline or fail to enter into a contract based upon this tender when called upon so to do.

For the due fulfilment of any such contract the undersigned will give satisfactory security on real estate, or by the deposit of money, public or municipal securities, or bank stocks to the amount of five per cent. on the bulk sum to become payable under such contract (the amount of the above mentioned cheque to be taken as part of said security.)

Submitted with this tender are marked samples of the building stone, cement, lime, sand, cut stone and brick proposed to be used in performing the work.

The undersigned proposes and agrees to fully and entirely complete the works above mentioned within thirty months from the date on which notification is given the undersigned of the acceptance of this tender by the Commissioner of Public Works.

The proposed sureties for the carrying out of these conditions, and for the due fulfilment and performance of any such contract, are the persons whose actual and *bona fide* signatures are written to the proposal in that behalf hereunder attached.

Your obedient, etc.,

JOHN HERBERT,
93 Seaton Street, Toronto.

We, the undersigned, whose actual signatures, places of residence and occupations are hereunder written and attached, propose and agree to become sureties for the due fulfilment and performance in all particulars of any contract entered into in pursuance of the foregoing tender, and for the carrying out of all conditions referred to therein.

Dated this second day of September, A.D. 1886.

FRANK BABY,
28 Arcade, Toronto.

M. O'CONNOR,
95 Church Street, Toronto.

TENDER

For the Excavating and the Masonry and Bricklayer's Works, labour and materials, and certain other works, etc., in connection therewith, required for and in the erection and construction of the proposed new Parliament and Departmental Buildings for the Province of Ontario, according to the plans and specifications therefor prepared by Richard A. Waite, Esq., Architect.

SEPTEMBER 9TH, 1886.

To the Commissioner of Public Works for Ontario:

SIR,—It is hereby proposed and agreed by the undersigned to do, perform, furnish and supply, and in all respects fully complete the entire Excavating and Masonry and Bricklayers' Works, labour and materials required for or in the erection and construction of the proposed new Parliament and Departmental Buildings for the Province of Ontario, in accordance and compliance with the plans and specifications prepared therefor by Richard A. Waite, Esq., Architect, and all works, matters and things of whatsoever nature, character, or kind mentioned, included or intended by, in or under said plans and specifications, for the sum of $1,018,317 in Credit Valley stone; $929,252 in Queenston stone; $837,212 in Ohio stone; $802,993 in Pelee Island stone.

Accompanying this tender is an accepted bank cheque payable to the order of the Honourable the Commissioner of Public Works for Ontario, for the sum of eight thousand dollars; and it is understood and agreed that said cheque and the amount thereof will stand and be forfeited to the said Commissioner of Public Works, for the use of the Province of Ontario, if the undersigned shall decline or fail to enter into a contract based upon this tender when called upon so to do.

For the due fulfilment of any such contract the undersigned will give satisfactory security on real estate, or by the deposit of money, public or municipal securities, or bank stocks to the amount of five per cent. on the bulk sum to become payable under such contract (the amount of the above mentioned cheque to be taken as part of said security).

Submitted with this tender are marked samples of the building stone, cement, lime, sand, cut stone and brick, proposed to be used in performing the work.

The undersigned proposes and agrees to fully and entirely complete the works above mentioned within months from the date on which notification is given the undersigned of the acceptance of this tender by the Commissioner of Public Works.

The proposed sureties for the carrying out of these conditions, and for the due fulfilment and performance of any such contract, are the persons whose actual and *bona fide* signatures are written to the proposal in that behalf hereunder attached.

Your obedient, etc.,

TORONTO STONE CO.,

Per ROBERT SNARR.
GEO. FARQUHAR.
THOS. SNARR.

We, the undersigned, whose actual signatures, places of residence and occupations are hereunder written and attached, propose and agree to become sureties for the due fulfilment and performance in all particulars of any contract entered into in pursuance of the foregoing tender, and for the carrying out of all conditions referred to therein.

Dated this ninth day of September, A.D. 1886.

FRED. B. GULLETT.
THOS. MURRAY.

TENDER

For the Excavating and the Masonry and Bricklayer's Works, labour and materials, and certain other works, etc., in connection therewith, required for and in the erection and construction of the proposed new Parliament and Departmentnal Buildings for the Province of Ontario, according to the plans and specifications therefor prepared by Richard A. Waite, Esq., Architect.

SEPTEMBER, 2ND, 1886.

To the Commissioner of Public Works for Ontario :

SIR,—It is hereby proposed and agreed by the undersigned to do, perform, furnish and supply, and in all respects fully complete the entire Excavating and Masonry and Bricklayer's Works, labour and materials required for or in the erection and construction of the proposed new Parliament and Departmental Buildings for the Province of Ontario, in accordance and compliance with the plans and specifications prepared therefor by Richard A. Waite, Esq., Architect, and all works, matters and things of whatsoever nature, character, or kind mentioned, included or intended by, in or under said plans and specifications, for the sum of one million two hundred and twelve thousand two hundred dollars ($1,212,200).

Accompanying this tender is an accepted bank cheque payable to the order of the Honourable the Commissioner of Public Works for Ontario, for the sum of Eight Thousand Dollars; and it is understood and agreed that said cheque and the amount thereof will stand and be forfeited to the said Commissioner of Public Works, for the use of the Province of Ontario, if the undersigned shall decline or fail to enter into a contract based upon this tender when called upon so to do.

For the due fulfilment of any such contract the undersigned will give satisfactory security on real estate, or by the deposit of money, public or municipal securities, or bank stocks to the amount of five per cent. on the bulk sum to become payable under such contract (the amount of the above mentioned cheque to be taken as part of said security).

Submitted with this tender are marked samples of the building stone, cement, lime, sand, cut stone and brick proposed to be used in performing the work.

The undersigned proposes and agrees to fully and entirely complete the works above mentioned within months from the date on which notification is given the undersigned of the acceptance of this tender by the Commissioner of Public Works.

The proposed sureties for the carrying out of these conditions, and for the due fulfilment and performance of any such contract, are the persons whose actual and *bona fide* signatures are written to the proposal in that behalf hereunder attached.

Your obedient, etc.,

JOHN SULLIVAN,
Contractor, Welland, Ont.

We, the undersigned, whose actual signatures, places of residence and occupation are hereunder written and attached, propose and agree to become sureties for the due fulfilment and performance in all particulars of any contract entered into in pursuance of the foregoing tender, and for the carrying out of all conditions referred to therein.

Dated this second day of September, A.D. 1886.

RICHARD MORWOOD,
Welland. Ont.

HENRY MINNEY,
Welland, Ont.

TENDER

For the Excavating and the Masonry and Bricklayer's Works, labour and materials, and certain other works, etc., in connection therewith, required for and in the erection and construction of the proposed new Parliament and Departmental Buildings for the Province of Ontario, according to the plans and specifications therefor prepared by Richard A. Waite, Esq., Architect.

September 2nd, 1886.

To the Commissioner of Public Works for Ontario:

Sir,—It is hereby proposed and agreed by the undersigned to do, perform, furnish and supply, and in all respects fully complete the entire Excavating and Masonry and Bricklayer's Works, labour and materials required for or in the erection and construction of the proposed new Parliament and Departmental Buildings for the Province of Ontario, in accordance and compliance with the plans and specifications prepared therefor by Richard A. Waite, Esq., Architect, and all works, matters and things of whatsoever nature, character, or kind mentioned, included or intended by, in or under said plans and specifications, for the sum of one million two hundred and fifteen thousand eight hundred and eighty-three dollars ($1,215,883).

Accompanying this tender is an accepted bank cheque payable to the order of the Honourable the Commissioner of Public Works for Ontario, for the sum of Eight Thousand Dollars; and it is understood and agreed that said cheque and the amount thereof will stand and be forfeited to the said Commissioner of Public Works, for the use of the Province of Ontario, if the undersigned shall decline or fail to enter into a contract based upon this tender when called upon so to do.

For the due fulfilment of any such contract the undersigned will give satisfactory security on real estate, or by the deposit of money, public or municipal securities, or bank stocks to the amount of five per cent. on the bulk sum to become payable under such contract (the amount of the above mentioned check to be taken as part of said security).

Submitted with this tender are marked samples of the building stone, cement, lime, sand, cut stone and brick proposed to be used in performing the work.

The undersigned proposes and agrees to fully and entirely complete the works above mentioned within thirty-six months from the date on which notification is given the undersigned of the acceptance of this tender by the Commissioner of public Works.

The proposed sureties for the carrying out of these conditions, and for the due fulfilment and performance of any such contract, are the persons whose actual and *bona fide* signatures are written to the proposal in that behalf hereunder attached.

Your obedient, etc.,

JOHN CARROLL,
Contractor, St. Catharines.

H. M. THAYER,
Contractor, 255 Simcoe Street, Toronto.

We, the undersigned, whose actual signatures, places of residence and occupations are hereunder written and attached, propose and agree to become sureties for the due fulfilment and performance in all particulars of any contract entered into in pursuance of the foregoing tender, and for the carrying out of all conditions referred to therein.

Dated this second day of September, A.D. 1886.

JOSEPH B. ALLEN,
Merchant, Toronto.

P. PURCELL,
Hotel-keeper, St. Catharines.

Department of Public Works, Ontario,
Toronto, 3rd September, 1886.

The Provincial Government has under consideration the advisability of substituting some other building-stone for the Credit Valley sandstone, called for by the plans and specifications prepared by Mr. Waite for the excavating and the masonry and bricklayers' works, etc., required in the construction of the proposed new Parliament and Departmental Buildings, and in respect of which you have submitted a tender.

I have to request, therefore, that before noon of Thursday next you will by sealed letter addressed to the undersigned and marked "Further tender for masonry work, etc., of Parliament Buildings," inform me what deduction will be made by you from the amount of your said tender if, instead of the Credit Valley sandstone so called for by said plans and specifications, there is substituted either—

(1) Pelee Island limestone, or
(2) Queenston limestone, or
(3) Ohio Buff sandstone.

It is, of course, to be understood that any stone so substituted for said Credit Valley sandstone must possess all the qualities which in respect of Credit Valley sandstone are set forth and required in or by said specifications.

Herewith I send you a blank form to be filled up with your reply, and a similar form with a letter of this tenor is this day forwarded to all the other parties who have sent in tenders in respect of the work above mentioned.

C. F. FRASER,
Commissioner.

The foregoing is a copy of a letter sent to each of the parties who sent in tenders in answer to the advertisement dated 11th of August, 1886.

Wm. Edwards,
Sec. D. P. W.

To the Commissioner of Public Works for Ontario:

Sir,—The undersigned acknowledges receipt of your communication of 3rd September instant, respecting the tender submitted to you by the undersigned and bearing date the 2nd September instant, for the excavating and the masonry and bricklayers' works, labour and materials, and certain other works, etc., in connection therewith, required for and in the erection and construction of the proposed new Parliament and Departmental Buildings for the Province of Ontario, according to the plans and specifications therefor prepared by Richard A. Waite, Esq., architect, and requesting to know what deduction from the total amount of said tender would be made by the undersigned if in the erection and construction of said works, etc., there were substituted for Credit Valley sandstone wherever the same is called for or required by said plans or specifications, either—

(1) Pelee Island limestone, or
(2) Queenston limestone, or
(3) Ohio Buff sandstone.

In the event of your deciding to make any such substitution, the undersigned will deduct from the total amount of said tender (1) the sum of seventy-four thousand dollars ($74,000) if Pelee Island limestone is so substituted for Credit Valley sand stone, or (2) the sum of nil if Queenston limestone is similiarly substituted, or (3) the sum of seventy-four thousand dollars ($74,000) if Ohio Buff sandstone is similarly substituted.

This revised tender is on the distinct understanding and agreement that in all respects any stone which may be so substituted shall wherever used in the erection or construction of said works have and possess all the qualities which in respect of Credit Valley sandstone are set forth and required in or by said plans and specifications.

The accepted bank cheque which accompanied the said tender of the undersigned is to stand and be forfeited to you as Commissioner of Public Works for the use of the Province of Ontario if the undersigned shall decline or fail to enter into a contract based upon said tender as varied by the terms of this revised tender.

Yours, etc.,

BROWN & LOVE,
Bay Street Wharf,
Toronto.

To the Commissioner of Public Works for Ontario:

SIR,—The undersigned acknowledges receipt of your communication of 3rd September instant, respecting the tender submitted to you by the undersigned and bearing date the 2nd September instant, for the excavating and the masonry and bricklayers' works, labour and materials, and certain other works, etc., in connection therewith, required for and in the erection and construction of the proposed new Parliament and Departmental Buildings for the Province of Ontario, according to the plans and specifications therefor prepared by Richard A. Waite, Esq., architect, and requesting to know what deduction from the total amount of said tender would be made by the undersigned if in the erection and construction of said works, etc., there were submitted for Credit Valley sandstone wherever the same is called for or required by said plans or specifications, either—

(1) Pelee Island limestone, or
(2) Queenston limestone, or
(3) Ohio Buff sandstone.

In the event of your deciding to make any such substitution, the undersigned will deduct from the total amount of said tender (1) the sum of seventy-five thousand five hundred dollars ($75,500) if Pelee Island limestone is so substituted for Credit Valley sandstone, or (2) the sum of—. The difference, in my estimation, would be in favour of Credit Valley red stone, and I can make no deduction if Queenston limestone is similarly substituted, or (3) the sum of sixty-nine thousand seven hundred and fifty dollars ($69,750) if Ohio Buff sandstone is similarly substituted.

This revised tender is on the distinct understanding and agreement that in all respects any stone which may be so substituted shall wherever used in the erection or construction of said works have and possess all the qualities which in respect of Credit Valley sandstone are set forth and required in or by said plans and specifications.

The accepted bank cheque which accompanied the said tender of the undersigned is to stand and be forfeited to you as Commissioner of Public Works for the use of the Province of Ontario if the undersigned shall decline or fail to enter into a contract based upon said tender as varied by the terms of this revised tender.

Yours, etc.,

LIONEL YORKE.

To the Commissioner of Public Works for Ontario:

SIR,—The undersigned acknowledges receipt of your communication of 3rd September instant, respecting the tender submitted to you by the undersigned and bearing date the 2nd September instant, for the excavating and the masonry and bricklayers' works, labour and materials, and certain other works, etc., in connection therewith, required for and in the erection and construction of the proposed new Parliament and Departmental Buildings for the Province of Ontario, according to the plans and specifications therefor prepared by Richard A. Waite, Esq., architect, and requesting to know what deduction from the total amount of said tender would be made by the undersigned if in the erection and construction of said works, etc., there were submitted for Credit Valley sandstone wherever the same is called for or required by said plans or specifications, either—

(1) Pelee Island limestone, or
(2) Queenston limestone, or
(3) Ohio Buff sandstone.

In the event of your deciding to make any such substitution, the undersigned will deduct from the total amount of said tender (1) the sum of twenty-eight thousand seven hundred and twenty dollars ($28,720) if Pelee Island limestone is so substituted for Credit Valley sandstone, or (2) the sum of nill if Queenston limestone is similarly substituted, or (3) the sum of fifty-seven thousand four hundred and forty dollars ($57,440) if Ohio Buff sandstone is similarly substituted.

This revised tender is on the distinct understanding and agreement that in all respects any stone which may be so substituted shall, wherever used in the erection or construction of said works, have and possess all the qualities which, in respect of Credit Valley sandstone, are set forth and required in or by said plans and specifications.

The accepted bank cheque which accompanied the said tender of the undersigned is to stand and be forfeited to you as Commissioner of Public Works, for the use of the Province of Ontario, if the undersigned shall decline or fail to enter into a contract based upon said tender as varied by the terms of this revised tender.

Yours, etc.,

JOHN HERBERT,
93 Seaton Street.

To the Commissioner of Public Works for Ontario:

Sir,—The undersigned acknowledges receipt of your communication of 3rd September instant, respecting the tender submitted to you by the undersigned and bearing date the 2nd September instant, for the Excavating and the Masonry and Bricklayer's Works, labour and materials, and certain other works, etc., in connection therewith, required for and in the erection and construction of the proposed new Parliament and Departmental Buildings for the Province of Ontario, according to plans and specifications therefor prepared by Richard A. Waite, Esq., Architect, and requesting to know what deduction from the total amount of said tender would be made by the undersigned if in the erection and construction of said works, etc., there were submitted for Credit Valley sandstone wherever the same is called for or required by said plans or specifications, either—

(1) Pelee Island Limestone, or
(2) Queenston Limestone, or
(3) Ohio Buff Sandstone.

In the event of your deciding to make any such substitution, the undersigned will deduct from the total amount of said tender, (1) the sum of one hundred and twenty-six thousand one hundred and fifty-two dollars ($126,152), if Pelee Island Limestone is so substituted for Credit Valley Sandstone, or (2) the sum of seventy-one thousand three hundred and thirty dollars ($71,330), if Queenston Limestone is similarly substituted, or (3) the sum of one hundred and eighty-two thousand seven hundred and ninety dollars ($182,790), if Ohio Buff Sandstone is similarly substituted.

This revised tender is on the distinct understanding and agreement that in all respects any stone which may be so substituted shall, wherever used in the erection or construction of said works, have and possess all the qualities which in respect of Credit Valley Sandstone are set forth and required in or by said plans and specifications.

The accepted bank cheque which accompanied the said tender of the undersigned is to stand and be forfeited to you as Commissioner of Public Works, for the use of the Province of Ontario, ifthe undersigned shall decline or fail to enter into a contract based upon said tender as varied by the terms of this revised tender.

Yours, etc.,

JOHN SULLIVAN.

Welland, September 8th, 1886.

To the Commissioner of Public Works for Ontario :

SIR,—The undersigned acknowledges receipt of your communication of 3rd September instant, respecting the tender submitted to you by the undersigned and bearing date the 2nd September instant, for the Excavating and the Masonry and Bricklayers' Works, labour and materials, and certain other works, etc., in connection therewith, required for and in the erection and construction of the proposed new Parliament and Departmental Buildings for the Province of Ontario, according to the plans and specifications therefor prepared by Richard A. Waite, Esq., Architect, and requesting to know what deduction from the total amount of said tender would be made by the undersigned if in the erection and construction of said works, etc., there were submitted for Credit Valley sandstone wherever the same is called for or required by said plans or specifications, either—

(1) Pelee Island Limestone, or
(2) Queenston Limestone, or
(3) Ohio Buff Sandstone.

In the event of your deciding to make any such substitution, the undersigned will deduct from the total amount of said tender, (1) the sum of three hundred and thirty thousand eight hundred and sixty-five dollars and forty-eight cents ($330,865.48), if Pelee Island Limestone is so substituted for Credit Valley Sandstone, or (2) the sum of two hundred and twenty-seven thousand and ninety-two dollars and twenty cents ($227,092.20), if Queenston Limestone is similarly substituted, or (3) the sum of four hundred and thirty-eight thousand three hundred and fifty-one dollars ($438,351), if Ohio Buff Sandstone is similarly substituted.

This revised tender is on the distinct understanding and agreement that in all respects any stone which may be so substituted shall, wherever used in the erection and construction of said works, have and possess all the qualities which in respect of Credit Valley Sandstone are set forth and required in or by said plans and specifications.

The accepted bank cheque which accompanied the said tender of the undersigned is to stand and be forfeited to you as Commissioner of Public Work, for the use of the Province of Ontario, if the undersigned shall decline or fail to enter into a contract based upon said tender as varied by the terms of this revised tender.

Yours, etc.,

JOHN CARROL,
Contrator,
St. Catharines.

H. M. THAYER,
Contractor,
254 Simcoe Street, Toronto.

ANALYSIS OF TENDERS.

DEPARTMENT OF PUBLIC WORKS, ONTARIO.

TORONTO, October 7th, 1886.

No.	NEW PARLIAMENT BUILDINGS TENDERS.		
1.	Brown & Love	Pelee Island stone	$698,700 00
2.	"	Ohio Buff sandstone	698,700 00
3.	Lionel Yorke	Pelee Island stone	733,500 00
4.	Brown & Love (reduced tender)	*Credit Valley* " (see No. 7)	736,000 00*
5.	Lionel Yorke	Ohio Buff sandstone	739,250 00

*Brown & Love's reduced tenders (No. 4), accepted 17th September, 1886 :
" declined (see letter) to enter into contract 30th September, 1886.

6.	Lionel Yorke (reduced tender).. *Credit Valley* sandstone $671,250; and 13,500,000 bricks from Central Prison @ $6,=$81,000. (See No. 11).....	752,250	00†
7.	Brown & Love.....*Credit Valley* stone (see No. 4)	772,700	00
8.	" .....Queenston limestone.....	772,700	00
9.	Carrol & Thayer.....Ohio Buff sandstone.....	777,032	00
10.	Toronto Stone Co..... .....Pelee Island stone.....	802,993	00
11.	Lionel Yorke.....*Credit Valley* " ..... (see No. 6—this tender reduced by $56,750)	809,000	00
12.	Lionel Yorke.....Queenston limestone.....	809,000	00
13.	Toronto Stone Co.....Ohio Buff sandstone.....	837,212	00
14.	Carrol & Thayer.....Pelee Island stone.....	885,018	00
15.	John Herbert.....Ohio Buff sandstone.....	892,834	00
16.	" .....Pelee Island stone.....	921,554	00
17.	Toronto Stone Co.....Queenston limestone.....	929,252	00
18.	John Herbert.....*Credit Valley* stone.....	950,274	00
19.	" .....Queenston limestone.....	950,274	00
20.	Carrol & Thayer.....Queenston "	988,791	00
21.	Toronto Stone Co.....*Credit Valley* stone.....	1,018,317	00
22.	John Sullivan.....Ohio Buff sandstone....	1,029,410	00
23.	" .....Pelee Island stone.....	1,086,048	00
24.	" ....Queenston limestone....	1,140,870	00
25.	" .....*Credit Valley* stone.....	1,212,200	00
26.	Carrol & Thayer.....*Credit Valley* "	1,215,883	00

WM. EDWARDS,
Secretary.

TORONTO, September 13th, 1886.

HON. C. F. FRASER,
Commissioner of Public Works.

SIR,—Since tendering for the Masonry of proposed Parliament Buildings we have received reduced offers for the stone from the Credit Valley, and now offer to execute the same thirty-six thousand six hundred dollars lower than at first, or for the sum of seven hundred and thirty-six thousand dollars, (736,000).

Also to substitute lime for cement in mortar of Brickwork, and laying brick in English bond, a further saving of eleven thousand dollars, or for the sum of seven hundred and twenty-five thousand dollars, ($725,000).

We are, Sir,
Yours obediently,

(Signed) BROWN & LOVE.

TORONTO, SEPTEMBER 13TH, 1886.

To the Honourable Commissioner of Public Works for the Province of Ontario:

SIR,—In accordance with your request, I send Tender No. 3 for the Parliament Buildings, as follows: Substitute the very best quality of "Fresh Burned Quick Lime in Lump" for cement mortar of brickwork only.

Also brickwork to be laid in modified English bond, *i.e.*, every fourth course a header.

†Lionel Yorke's reduced tenders (No. 6), accepted 1st October, 1886.
" accepted, and contract executed 7th October, 1886.

For the above changes I will make a reduction from my original tender (of Sept. 2nd, 1886) of thirteen thousand seven hundred and fifty dollars (13,750.00).

(Signed) LIONEL YORKE.

I also wish to state that since the original tender was sent in the parties wishing to supply the "Red Credit Valley Stone" have reduced their price considerably, and I will now do the work in accordance with plans and specifications in "Red Credit Valley Stone" making a reduction from my original tender of Sept. 2nd, 1886, of forty-three thousand dollars ($43,000).

(Signed) LIONEL YORKE.

Department of Public Works,
September, 17th, 1886.

Gentlemen,—I am directed by the Honourable, the Commissioner, to notify you that (subject to the understanding arrived at (1) with respect to the supplying of brick from the Central Prison brickyard; (2) the laying of same in modified English bond with every fourth course a header course; and (3) the substituting in respect of the mortar for the brickwork only the very best quality of fresh burnt quicklime in lump, instead of cement) your reduced tender for the excavating and mason and bricklayers' work, etc., in connection with the proposed new Departmental and Parliament Buildings (of Credit Valley stone, as called for by the specifications) will be accepted, and the contract awarded you in accordance therewith; provided that within ten days from this date you give and furnish satisfactory security for the completion of the contract to the amount of five per cent. on the bulk sum to become payable under said contract—said bulk sum being six hundred and forty-four thousand dollars ($644,000.00); and said security to be of the character stipulated in that behalf by the advertisement calling for tenders and by the specifications relating to the work.

I am, gentlemen,

Your obedient servant,

WM. EDWARDS, Secretary.

Messrs. Brown & Love,
Building Contractors, etc.,
Toronto.

Toronto, September 30th, 1886.

Hon. C. F. Fraser,
Commissioner of Public Works:—

Dear Sir,—After well re-considering the matter of entering into contract for the new Parliament Buildings, in Credit Valley stone, and now feeling assured we have based our calculations too low, we beg finally to decline to enter into the said contract.

Yours obediently,

BROWN & LOVE.

Department of Public Works,
September, 30th, 1886.

Gentlemen,—I am directed by the Honourable the Commissioner of Public Works, to acknowledge the receipt of your letter of this date, finally declining to enter into a contract for the works for which you tendered in connection with the erection of the proposed new Parliament and Departmental Buildings. I am further instructed to say that in

accordance with the conditions upon which tenders were called for, the cheque for $8,000 (eight thousand dollars) which accompanied your tender is forfeited for the public uses of the province.

I am, gentlemen,

Your obedient servant,

WM. EDWARDS, Secretary.

Messrs. Brown & Love,
Building Contractors, etc.,
Foot of Bay Street, Toronto.

Department of Public Works,
September, 30th, 1886.

Sir,—Messrs. Brown & Love, the parties whose tender for the erection of works in connection with the proposed new Parliament Buildings was accepted, having declined to enter into a contract in accordance with their tender, and the conditions upon which tenders were called for, the cheque for $8,000 (eight thousand dollars) which accompanie their tender has been forfeited, and has been endorsed by the Honourable the Commissioner to be paid to you as Treasurer of the Province of Ontario, for the uses of said Province.

The cheque referred to is herewith enclosed and for which you will please give me a Departmental receipt.

I am, sir,

Your obedient servant,

(Signed) WM. EDWARDS, Secretary.

The Honourable
The Provincial Treasurer for Ontario.

Treasury Department, Ontario,
Toronto, September 30th, 1886.

Sir,—I have the honour to acknowledge the receipt of your communication of the 30th inst. enclosing a check on the Dominion Bank, Toronto, for the sum of $8,000 on account of forfeiture *re* contract Parliament Buildings.

I have the honour to be, Sir,

Your obedient servant,

W. R. HARRIS,
Assistant Treasurer.

Wm. Edwards, Esq.,
Secretary Public Works Department,
Toronto.

Department of Public Works,
October 1st, 1886.

Sir,—I am directed by the Honourable the Commissioner to notify you that (subject to the understanding arrived at (1) with respect to the supplying of brick from the Central Prison brickyard; (2) the laying of same in modified English bond, with every fourth course a header course; and (3) the substituting, in respect of the mortar for the brick-

work, only the very best quality of fresh burnt quick lime in lump, instead of cement) your reduced tender for the excavating and mason and bricklayers' work, etc., in connection with the proposed new Departmental and Parliament Buildings (of Credit Valley stone as called for by the specifications) will be accepted and the contract awarded you in accordance therewith; provided that within *one week* from this date, you give and furnish satisfactory security for the completion of the contract to the amount of five per cent. on the bulk sum, to become payable under said contract—said bulk sum being six hundred and seventy-one thousand two hundred and fifty dollars ($671,250) and said security to be of the character stipulated in that behalf by the advertisement calling for tenders and by the specifications relating to the work.

I am, Sir,

Your obedient servant,

(Signed) WM. EDWARDS,
Secretary.

Lionel Yorke, Esq.,
Building Contractor, etc.,
Toronto.

SPECIFICATION OF THE EXCAVATING AND THE MASONRY AND BRICKLAYERS' WORKS, LABOUR AND MATERIALS AND OTHER WORKS, Etc., IN CONNECTION THEREWITH.

Required for and in the erection and construction of the proposed new Parliament and Departmental Buildings for the Province of Ontario, to be erected on the site known as the Queen's Park, in the City of Toronto, according to Plans and Drawings prepared by and under the supervision of Richard A. Waite, Architect.

July, 1886.

Condition of Submitting Tenders.

Tenders must be made in a lump sum for the entire Excavating, Concreting, Stone and Brick Masonry Work, providing cutting and setting of cut stone, including all labour, stone, bricks, cement, lime, dressed stone, and water; also bedding and setting plates for all the iron work of vaults, floors and building complete the masonry work of foundations, base and superstructure, including chimneys, of the proposed new Provincial Parliament and Departmental Buildings, in the City of Toronto, in strict accordance with working drawings Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, and the specifications.

Samples and time of completion.

Each person tendering must submit with his tender properly marked samples of the building stone, cement, lime, sand, cut stone and brick, which he proposes to use in performing the work, also to state in his tender the time in which he proposes to complete the work. The quality of the material and the time required will be considered in awarding the contract.

Payments.

Payments will be made monthly, deducting fifteen (15) per cent. of the value of th work executed, until completion of the contract

Security.

Tenders must be made in the printed form prepared for the purpose, which can be obtained on application at the Department of Public Works, and each tender must be accompanied by an accepted bank cheque payable to the order of the Honourable the Commissioner of Public Works for Ontario for the sum of eight thousand dollars, which cheque and the said sum of eight thousand dollars will stand and be forfeited to the said Commissioner of Public Works, for the use of the Province of Ontario, if the person tendering declines or fails to enter into a contract based upon such tender when called upon so to do. The contract to be entered into shall be to the satisfaction of the Commissioner of Public Works, and for the due fulfilment of any such contract, the person entering into the same will give satisfactory security on real estate, or by the deposit of money, public or municipal securities or bank stocks, to the amount of five per cent. on the bulk sum to become payable under such contract (the amount of the above mentioned cheque to be taken as part of said security).

To each tender must be attached the actual signatures of at least two responsible and solvent persons, residents of Ontario, willing to become sureties for the carrying out of these conditions, and for the due fulfilment and performance of the contract in all particulars.

Rights Reserved.

The right to reject any or all tenders or to waive defects or irregularities therein is to be in the discretion of the Commissioner of Public Works, and the Commissioner will not be bound to accept the lowest or any tender.

Tenders Considered.

Tenders should conform in every respect to these requirements and will be considered only when received from parties engaged in the class of work covered by these specifications, and who can refer to the work of his character performed by them.

Sub-letting.

The contractor to whom this work is awarded will not be permitted to assign or sub-let the same or any portion thereof without the consent of the Commissioner of Public Works, and whenever such assigning or sub-letting is permitted, the party performing the work so assigned or sub-let will be considered the agent of the contractor and the contractor will be held responsible for all indebtedness incurred by said agent on account of the work.

The Commissioner of Public Works reserves the right to retain a sufficient sum to meet any liabilities incurred by the contractor on account of the work, until satisfied that settlement has been made.

Endorsement.

Each tender must be enclosed in a sealed envelope, endorsed "*Tenders for Masonry Works, etc., of Parliament Buildings,*" and must be addressed to the Hon. C. F. Fraser, Commissioner of Public Works, Toronto, Ont.

Excavators' Work.

Setting out the Building.

The contractor to employ a competent civil engineer to accurately set out the building, giving all levels above and below zero. This datum line zero will be established on the site, under the direction of the architect. The contractor is to render the engineer all necessary assistance and provide the requisite substantial batter boards, stout stakes, and labour for placing same firm and permanent.

Excavation.

Excavate to the depths below zero as figured on plan No. 1 the entire length and width of the foundations as per plan of construction, extending the excavation two (2) feet beyond (all around) the outside plumb line of foundation walls. All foundations must rest upon unyielding or "virgin" soil.

After the excavation has been completed, the contractor to commence on the trenches for concrete footings under outer walls, and excavate for same to the various widths and depths as figured on plan showing foundation.

Disposal of Earth.

Sufficient earth to be piled up upon the site in "spoil banks" out of the way of building operation, for subsequent grading to the line of grade stakes, after the completion of foundation walls. All surplus earth is to be carted away from the site and beyond the park in which the building is to be situated.

Dwarf walls.

The excavation for the foundation of dwarf walls, approaches of stone steps, "porte-cochere" and trenches for foundations of inner walls, to be done at the time and as directed by the architect. Surplus earth to be carted away as above specified.

Tunnel.

The excavation for tunnel to be done when directed by the architect. Said trench when opened to be secured by poling plank, wales and struts. All surplus earth to be carted away as above specified.

Sand.

The contractor may use all sand and gravel from excavation, suitable for mixing in with broken stone for the concrete and cement mortar, providing always that the contractor has procured from the architect his statement in writing that the sand and gravel are both suitable for the purpose herein named.

Filling in Inside.

The earth to be filled in to the top of footings as soon as the pargetting has become set.

Filling in Outside.

The filling in and grading to the outside face of walls, to be done when walls have been thoroughly weather pointed, cement set, and walls examined and approved by the architect or his clerk of the works.

The above and all other filling in to be done with clean earth, gravel and sand in regular layers of six to eight inches, ramming or pounding each layer with wooden rammers, and also to be consolidated by watering.

Additional Excavation.

In the excavation herein described the nature of the soil may determine the architect to deepen or widen the same, or both, as deemed necessary. In case the excavation exceeds plans, sections, and figures detailed for this work, the contractor will be paid the price per cubic yard pro rata of contract; but in every such case the quantity of such additional excavation and the measurement thereof, is to be fixed, determined and ascertained on and by the certificate of the architect, or clerk of the works employed by the Commissioner of Public Works, and before such additional excavation is proceeded with the contractor is to procure the written order of the Commissioner of Public Works authorizing the same.

Protecting Excavations.

The contractor to provide, fix, and remove as may be necessary all shoring, strutting, and planking for carrying out the work of excavation and upholding the sides or slopes of the ground during the time that the excavations are open.

Temporary Drainage.

Sanitary or permanent drainage is intentionally omitted from this specification.

The contractor is to obtain from the proper authorities, in that behalf, the necessary permit to open the most convenient street sewer that will meet the requirements, and connect therewith a twelve-inch sewer pipe, extending the same within the walls of the proposed building, and from same provide and lay the required number of six-inch branches within the walls to take off all surface water and rains, to ensure the keeping of foundations and excavated surfaces (basement) dry during the progress of the work. Also construct an eight-inch branch connection to contractor's sanitary accommodation for workmen. Provide said twelve-inch pipe with vented running trap, and the necessary six and eight-inch 'Y's T's, for branches, with quarter bends at the ends of each drainage branch protected with cast iron bell trap. Said pipe to be of salt glazed socket jointed pipe, laid to proper levels with joints made of cement mortar. As and when directed by the architect or by the Commissioner of Public Works the above drainage is to be removed, the street sewer is to be repared and all footings of foundations are to be made good.

CONCRETE FOUNDATIONS.

Cement.

Unless otherwise authorized by the Commissioner of Public Works, the cement to be used must be of Canadian manufacture, and *first*, must be so finely ground that 85 per cent. shall pass a sieve of 2,500 meshes per square inch ; *second*, when made up wet, and filled into a glass bottle or similar article and struck level with the top, it must not in setting, crack the vessel or rise out of it or become loose in it by shrinkage ; and *third*, when wet up and made into "briquettes" and given one hour in air, then 23 hours in water, the cement must be capable of withstanding a tensile strain of fifty-five (55) pounds per square inch before fractured, and at seven days in water after the first hour in air, it must sustain a tensile strain of one hundred and twenty-five (125) pounds.

The inspecting and approval of any quality of cement will not ensure the entire use of same, as the cement will be subject at all times during the progress of the works to the above tests ; and any cement not fulfilling the above requirements must be immediately removed from the premises.

The testing of cement will be made by the Architect or his Clerk of the Works, and the approval of any carload or lot of one manufacturer will not ensure the entire use of same, as no cement will be considered as accepted until after it has been tested, and has passed inspection. The cement not fulfilling the above requirements will be branded and must be immediately removed from the premises, and good and proper cement substituted in lieu thereof.

Storing Cement.

The contractor will be required to build and keep in proper repair, a perfectly weather proof building suitable for storing the cement, as it is delivered by the car load or otherwise.

Sizes of Concrete Footings.

Plan No. 2 shows the various lengths, breadths, and depths of the concrete foundation.

Concrete.

The concrete for footings and foundation of tunnel to be composed of three (3) parts of stone or hard brick rubbish, both to be broken up to pass through 2-inch ring, two (2) parts of coarse sand, and one (1) part of cement.

The ingredients to be mixed by being twice turned over dry, in a box, then shovelled a third time, at the same time adding from the rose of a hose sufficint water to make the ingredients cling together in a pasty mass.

Concrete Filling.

Concrete to be mixed thoroughly by the side of trenches, deposited in horizontal layers about 8 inches thick, added until the requisite thickness is obtained; each layer to be lightly pounded or beaten down with wooden rammers, sufficient to bring moisture to the surface. Care to be taken to cover any joints in one layer by the succeeding one, well wetting the last layer to ensure proper connections with the next.

Saturate Trenches.

Saturate the bottom of the trenches with cement and sand, sufficient to keep the water in the concrete from washing away. All edges or surfaces of concrete where left off, that have become dry, to be swept to remove the dust, and well wetted.

Protecting Concrete.

Every care is to be taken not to disturb the concrete while setting. Should it be necessary to pass over it, planks are to be carefully laid down for the purpose; and precaution must be taken to protect the finished surface from being injured by traffic or falling materials, etc. The concrete in the trenches is to be kept damp for at least five days after laying, by flooding it with water or covering it with sand, sawdust, or other approved material, kept constantly damp with water from a rose. The concrete work is not to be executed during frosty weather, or even if there should be any probability of the frost occurring before concrete has had time to set.

Additional Concrete.

Should the nature of soil at spots require additional depth and width of excavation, the space excavated to be filled up with concrete same in quality, manner, etc., as above specified. The contractor to be paid the price per cubic yard pro rata of contract; but in every such case the quantity of such additional concreting and the measurement thereof is to be fixed, determined, and ascertained by the Architect or Clerk of the works, employed by the Commissioner of Public Works, and before such additional concreting is proceeded with, the contractor is to procure the written order of the Commissioner of Public Works authorizing the same.

Frost Protection.

Thoroughly protect the concrete foundation from frost during the winter months with two feet deep of sand, and in addition a covering of one-inch plank firmly secured.

BUILDING STONE.

The building stone for footings and foundation walls must be of Canadian product, and the selection will be made from among those of a permanent character, and having special regard to strength, least liability of weathering or disintegration, and possessing the greatest weight and the least capacity for absorbing water.

With sample of stone submitted with tender, state in writing where quarry is located, how long in use, structures in which used, and how many car loads can be furnished per day.

All stone to be furnished must be of same quality in all respects as the specimen or sample so submitted.

All stone to be laid on their natural or quarry beds, or with their natural beds, as far as possible, perpendicular to the pressure they have to bear.

Dimensions of Footings.

The first and second courses of stone footings, also third course (where indicated on plan) under all foundation walls to be of dimension stone quarried to the lengths, widths, and thicknesses, indicated on plan, and sectional views showing footings.

Should the contractor receive stone of greater thickness than figured on plans, he may lay the course with the increased thickness at his own cost.

Beds of Footings.

The beds of footings to be plain, level and full, with mortar joints of $\frac{3}{4}$-inch between the general surface planes of the stones. All quarry surface irregularities to be reduced to a close approximation by scabbling or spalling, sufficient to transmit the pressures from stone to stone without actual contact at any point of the surface.

Joints of Footings.

Each heading joint to be hammered, blocked, or roughly picked to a line; joints about $\frac{3}{4}$ of an inch in thickness. All inside length joints close and square not over $1\frac{1}{4}$ inches open, and each joint flushed or grouted solid with cement mortar.

No chips or spawls to be used either between stone or for the purpose of pinning up or levelling stone on stone.

Setting Footing.

The face of the stone and concrete must be perfectly cleaned off and all thoroughly wet before the cement mortar is spread to receive the footings. Each stone must be lowered to the place of setting, with a derrick and fall, and settled with a heavy wooden rammer to a solid level and uniform bed to insure its transmitting the pressure over the entire surface.

Pargetting.

The outside face or footings to be pargetted one inch thick from the top of concrete, with cement mortar forming a close and water-tight connection with concrete. The outside face of tunnel to be pargetted with at least 3 inches of cement mortar. Pargetting work to become set sufficiently hard before filling in.

Cement Mortar.

The above specified footings, and pargetting, also the following specified rubble masonry work (foundation walls) to be laid up in thoroughly worked fresh cement mortar, mixed in small quantities as required for use.

The cement to be of the same quality and subject to the same tests as hereinbefore mentioned for concrete. The mortar to be composed of one (1) part cement to two or two-and-a-half parts of clean sharp grit coarse sand (not clayey or loamy sand) to be thoroughly dry mixed by repeated hoeing over, then adding from the rose of a hose sufficient water to make same a workable and pasty mass.

Foundation Walls.

The walls above stone footings courses to be built up the various heights shown in Rubble worked up to Courses—coursed header work—from eighteen (18) to ten (10) inch depths of courses, according to the nature of the stone. The quoins or angle stones are to be laid with care and accuracy, to serve as guages to level courses up to. One-fourth part, at least, of the face in each course to consist of bond stones, not less than thickness of wall in length; height equal to that in the course and three (3) to four (4) feet in width.

Stretchers one-half thickness of wall in width, about four (4) feet in length, height equal to that of the course. Between headers to be built of smaller stone, but each stone to have at the least one-and-one-half more bed than rise.

All the above stone to be roughly squared with the hammer, their beds hammer-dressed to approximate planes, and hammer-dressed faces to lines; avoid deficiency of bond by placing two headers of successive courses above each other. Care to be taken that each stone shall rest on its natural bed, and the sides parallel to that natural bed to be the largest. All courses to break joint, and all hollows between the larger stones to be carefully filled with smaller stones completely embedded in mortar.

Large stones equal in depth to two or three courses of the rubble walling, and having an excess in length and width to be built in at all quoins and angles to bond the work and insure its uniform compactness, especial care being to make the walls of equal solidity by well filling the inner joints.

NOTE.—The quoins ends adjoining or tailing into the rubble to be left comparatively rough.

Openings.

All channels, ducts, openings required by the plans or as hereafter directed by the architect, to be built as the work progresses.

Joints of Masonry.

The thickness of the bed joints must be sufficient to prevent any unequal bearing from actual contact between irregularities.

All joints to be full and filled up solid with the above specified mortar, and stone thoroughly bedded by repeated blows from the hammer.

The outside face of walls to have the "Mason Joint" struck joint, well struck back at the top edge of the horizontal joints. The inner face of walls to be wetted and thoroughly flush pointed. The surfaces of walls (bed of base) as built to the various levels required to form grade line, to be thoroughly pargetted with cement mortar.

Building.

The horizontal courses to be kept level throughout, and the walls built uniformly, that is, one part of the walls must not be carried up more than four (4) feet before the remainder is brought to the same level.

Protection During Frost.

The construction of building proper will be stopped at the approach of winter, and the contractor will be required to protect the footings and foundation walls secure against rain and frost, by covering walls and footings with sand, straw or manure, held in place with planks loaded by heavy stones.

BRICKLAYER.

The portions of walls coloured red on plans indicate entire brickwork, and the walls shown in brown and red constructed of brickwork and stone facing.

Quality of Brick.

The brick to be the best quality, common, hard burned, square, sound, free from lime stone, misshapen, etc., and taken from the heart of the kiln, no bats, soft, salmon or defective brick will be allowed.

Note.

The contractor is to purchase during the progress of the building, and to use in the erection and construction thereof, such quantities of brick as can be supplied from the brickyard of the Central Prison, at the City of Toronto, paying market value for same in monthly payments. Said brick must in every respect comply with the "quality of brick" above specified.

The brickwork of interior walls and backing of exterior walls to be English Bond, that is to say, the heading and stretching courses are to be laid alternately, and no stretchers to be used except those seen on the face (or against stone facings) however thick the wall may be.

All brick to be thoroughly bedded and jointed in cement mortar, and laid as close to each other as the character of the brick will allow, the joints of each course of brickwork to be thoroughly flushed up solid with mortar, well worked in with trowel, leaving no hollows, and where the walls and backing are more than one and a-half ($1\frac{1}{2}$) bricks in thickness, to be grouted with liquid mortar, in addition to the flushing.

Wetting Brick.

Bricks to be wetted before being built in the walls, either just before taking them on to the scaffold or soaking brick into bucket of water on the scaffold.

Thickness of Joints.

No four courses including three joints to guage more than one inch in addition to the thickness of the brick.

Joints Cut Off Rough.

The exposed joints of all interior brickwork to be cut off rough for plastering.

Mortar.

The mortar for all brickwork to be one-third ($\frac{1}{3}$) by measure of fresh ground cement, equal in quality (and subject to same tests) as hereinbefore specified for concrete, and two-thirds ($\frac{2}{3}$) by measure of clean, sharp, white, grit sand, free from clayey or loamy substances. The cement mortar to be thoroughly dry mixed by repeated working over, then water mixed, immediately before using, into a limy pasty mass; after it has once began to set it will not be permitted to be used.

Arches.

The arches of interior reveals of door and window openings of four (4) feet radius and under, to be built in two (2) half brick rings (rowlocks) and to extend through the full depth of reveals or thickness of walls. Arches of larger radius to be built showing alternate header and stretcher courses on the soffit or with four (4) or more, half brick rings with bonding or lacing courses (header and stretcher) built in at intervals.

The arches for register openings, heating and ventilating flues and fire place openings, to be guaged straight arches; skewbacks of same inclined to an angle of 60 degrees. Set fire place, cast iron lintels as provided by contractor for iron work.

Trimmer arches to fire-places to be one-ring arch, turned from the chimney breast to trimmer joist.

Arching Between Iron Beams.

Each vault floor and ceiling, and floors of building, where indicated on plan for fire proof construction, to be filled in between beams with segmental brick arches. The floors with one-half brick thick, the vaults full brick thick. The bearing bricks on the flange of beam must be moulded for the purpose and laid solid and true, and perfect segmental arches formed with selected very hard brick laid with thoroughly flushed joints, and keyed with slate chips.

The ingredients of concrete for pugging over the above brick arches, also hearths to fire places, to be one part cement, four (4) parts breeze, or other approved porous material such as slag, scoriæ or hard brick rubbish, which must pass through a 3-4 inch mesh, the proportion of sand to suit the porosity of breeze. Said ingredients to be thoroughly water mixed, lightly tamped or punned into place, and levelled off at the top of sleepers.

Centres.

The contractor to supply or set up the centres for all the arches and tunnel, built to the required radius and of sufficient strength and rigidity to carry and firmly support the arching. Centres must not be eased or struck until the mortar is thoroughly set.

Skewbacks.

Purpose made skewback brick to be built in walls, at the required levels for springing the floor arches of the several floors and vaults. The clerk of the works will give the position and level of these courses of skewbacks. The contractor will provide purposely moulded brick for tunnel to suit the radius of same; also build in the cast iron man-hole frames provided by the contractor for iron work.

Flues and Recesses.

The flues for dust chutes heating and ventilating purposes, and recesses for piping to be continued and constructed in interior walls and in backing to exterior walls where shown on plans, the flues to be built regular and true, with selected brick and smoothly trowel pointed as the work proceeds. All flues and recesses to be the dimension shown and marked on the plans.

All the smoke flues (shown circular on plans) to be lined with eight (8) inch flue linings, made of the best fire clay, to have soap stone thimbles 8-inch by 8-inch by 4-inch with a pipe hole 7 inches in diameter; set in the position and apartments directed by the architect.

The ventilating flues for each vault to be four and one-half (9) by eighteen (18) inches, made of terra cotta clay, provided with elbows and register connections, top and bottom of each vault.

Vaults.

The contractor will assist the vault men in setting and adjusting vestibules of vaults, also properly bed and assist in setting in the place the rolled "I" beam lintels provided by the contractor for iron work of structure. The inner face and ceilings of vaults to be lined with selected buff (white) pressed bricks, the very best of Toronto manufacture, laid up in white putty mortar. The entire outer faces to be faced with the very best quality of A1 Scotch fire brick, laid up in mortar same as hereinbefore specified for brickwork, with hacked out joint.

Hollow Brick.

The partitions dividing apartments on ground and first floors, indicated to be carried upon rolled iron girders, to be built of hollow partition blocks, of terra cotta or fire clay pottery twelve inches long, four inches wide, and six inches deep, set up plumb and secure.

NOTE.—The rolled iron beams will be provided and set by the contractor for iron work.

Chimneys.

The contractor will build up the large chimneys for heating and pressure boilers, as indicated on plans. The inside at and above flue opening for a distance of twenty (20) feet to be lined with A1 Scotch fire brick, laid up in Kaolin mortar. The contractor will provide and build in the largest size iron cleaning door and frame, also construct flue openings of the form and position directed. The greatest care to be taken that a uniform batter of 3-16 inch per foot is preserved on each of the inner four faces, and each joint, both horizontal and vertical, filled flush with the faces of brickwork and rubbed smooth. The contractor will build in proper bonding strips of hoop iron cut to the various lengths required, at vertical intervals of about three (3) feet. The contractor will provide and build in one corner of each flue (placed diagonally) 5-8 inch iron bars at vertical intervals of about 18 inches apart to constitute steps or ladder for gaining access to the top of the chimney.

Walls Carried up to Roof.

All the interior walls shown on attic story plan and the backing of the exterior walls are to be carried up to underside of roof covering.

Pockets for Beams.

The contractor will form pockets for girders and beams in stone and brickwork in positions as directed by the architect or clerk of the works.

Setting Plates and Building in Iron Work.

The contractor will level for, bed and set the plates for the iron beams indicated on plan (fine blue lines) which will be spaced about four feet apart, and build in all the iron work, doing all beam filling required up to underside of slates, and drill all holes in both stone and brickwork necessary for iron anchors, etc., of iron work.

Bevels, Curves, etc., in Brickwork.

Contractor to do all corbelling, cutting of bevels, curves, skewbacks, etc., required, the arrises of both stone and brickwork to be plumb, straight and true, faces of walls out of wind, the dimensions and positions of walls, openings, flues, recesses, etc., to be as shown on the drawings.

Note.—In corbelling out brickwork, the oversail or projection of each offsett must not exceed one-eighth ($\frac{1}{8}$) of a brick.

Building.

The horizontal courses of cut stone and brickwork must be kept perfectly level throughout, and the walls built uniformly, that is, one part of the building must not be carried up more than two courses of stone before the remainder is brought to the same level unless otherwise ordered by the Clerk of the works.

CUT STONE.

Quality of Stone.

The base, from varied grade line to level, of the entire structure, and façades of entire superstructure, including porch entrance, gables, dormers, chimneys, "Porte-Cochere," vestibules, buttresses, platforms, and steps to all entrances, and interior works shown by eight scale elevations and half-inch scale detail drawings, to be executed with Credit Valley sandstone. Said stone must possess these essential qualities: strength, weight, appearance, facility of working and durability.

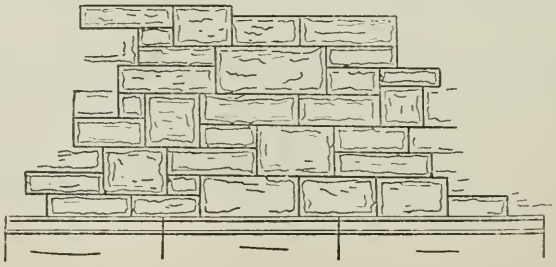
The stone base, facings of walls of superstructure, dormers and chimneys, cut stone trimmings, as indicated on the many drawings must be of close-grained, good texture, uniform in colour and free from flaws, rifts, drys or defects, other than such as are allowable in strictly speaking first-class work. The quarry from which the stone is proposed to be obtained must be fully opened and capable of furnishing the quantities and dimensions required by the drawings and within the time proposed by the contractor and fixed by the contract. The name and location of the quarry must be stated.

Quarry Beds.

All stone must be cut to lie on its "natural bed," that is, in the position in which it was originally deposited, not of necessity the position it occupies in the quarry.

Irregular Coursed Ashlar.

The facing for body of walls, dormers, chimneys, etc., to be "irregular-coursed random, snecked, or square ashlar work," rock-face. No stone to have a bearing on bed less



than area of its face, and built up solid, with proper housings for bond with brick backing. All joints to be vertical and the beds horizontal, as indicated by sketch.

The beds and joints worked to plane surfaces to allow close-fitting joints, to be square with the face of walls and worked true enough to allow of joints one-quarter ($\frac{1}{4}$) of an inch. The rock-facing to be pitched from, and not project less than one and one-half ($1\frac{1}{2}$) inches from line of joint, and vary to four (4) inch projection; and, however rough, to project in the centre and possess four well-defined edges. No stone of less area than forty-two (42) square inches on the face to be used, and no stone to have a bearing area on bed less than the area of its face.

Angles of building and jambs to have coarse drove margins of the various widths indicated on drawings or directed by the architect as the work progresses.

Bond Stone.

Two bond stones to be built in with every yard superficial of ashlar; in heighth that of the course, in length within four inches of inner face of walls, width twice the heighth of course. The backing up to be built in courses and levelled up in all cases to coincide with the course of ashlar.

Bed and Joints.

The bed and joints of all the cut-stone work to be chisel-drafted round the margins, and dressed down with the point full, true, and out of wind, to have an equal bearing throughout, and so worked that when set the joints will not exceed $\frac{3}{16}$ inch thick between the general surface planes, and vertical one-eighth ($\frac{1}{8}$) of an inch.

In the setting of piers, shafts, mullions, stones to be nearly in contact, with a layer of thin, hard pine wood or sheetlead, to reach within one (1) inch of the edge of stone.

Water Joints.

The water joints of copings, cornices, and stone work exposed to the rain, and exceeding 16 inches projection beyond line of wall or on face of stone, to be saddled or water jointed.

Dimension Stone.

All the cut stone indicated on the elevations and half-inch scale drawings and all reveals to be of the dimensions shown and figured on the drawings, all moulded work, both circular and straight, to be of profiles shown, cut sharp and clean from zinc moulds made in strict accordance with the full size drawings furnished and to be furnished the contractor, dressed or differently treated as follows :—

Treatment of Stone.

Plain Work.

Chiselling down the inequalities left by punch or point, leaving the chisel marks running random over the surface.

Pointed Work.

The face of stones worked down to a regular surface and dabbed all over with the point, the marks of the tool running in lines at right angles to the bedding of the stone.

Boasted Work.

The marks of the tool (chiselling) run in parallel lines, each successive stroke being made beneath the last, down the whole length of stone.

Drove Margins.

Chiselled draft lines of two or more inches in width, each stroke of the tool made by the side of the last, to form a series of parallel lines, and each line extending across the whole breadth of the margin or depth of reveal. Around arches, lines to radiate from the same centre as the curve of the arch.

Crandle.

The surface of stone obliquely struck with toothed hatchet composed with eight or ten pointed chisels, forming short crossing furrows or lines.

Patent Hammer.

The surface to show parallel marks as fine as can be worked with "patent hammer" of eight blades, arch lines as above.

Stroked Work.

The shafts of principal entrance to be stroked (striped) work, tooling to run at an angle or about forty-five (45 degrees).

Rubbed Work.

All interior plain surfaces to be rubbed down to a perfectly smooth surface.

Note.—The above different modes of treatment will be indicated on full size drawings by initials.

Carved Work.

The capitals of columns, mullions, transom and spandril ornaments, frieze, panel, terminals of hood moulds, gables, corbels, gargoyles, belt courses, cornice, finials, ridges, etc., to be carved in strict accordance with drawings to be furnished therefor, leaving all marks of the chisel untouched and in fineness to conform with position of work. All carving to be with spirit, and executed in the most artistic manner, by an acknowledged carver or carvers, who can refer to existing works as evidence of his or their skill, which must receive the approval of the architect before his or their employment.

Setting.

All the stone to be thoroughly bedded, jointed and plastered on the back with lime mortar, and set in accordance with the drawings; the joints to be 3-16 inches wide (not over) and set open.

Lime Mortar.

The mortar for all the stone work to be the best quality, one-third ($\frac{1}{3}$) by measure of best quality of wood burned stone lime, and two-thirds ($\frac{2}{3}$) by measure of clean, sharp sand, the lime to be slacked and left to sour two months before being used.

Grand Staircase.

The grand staircase from ground to first floor, including the columns and arcade in connection with same, is intentionally omitted, as the same will be contracted for separately. The contractor for the within specified works will attend and provide offsets, housings, etc., in his portion of work that naturally forms part of staircase construction.

Centres.

Contractor to furnish the material, build and set all the centres required for stone arches, which must be of sufficient strength and rigidity to sustain the weights, and not to be eased or struck until the mortar is thoroughly set.

Building in Cramps, Dowels, etc.

Contractors to cut groves in all weathering stone work for flashings, valleys, gutters, etc., the depths, and where required or directed, to attend upon, cut away for, and make good after all trades requiring same; to make the sinkings for, thoroughly embed by lead or cement, and properly build in all the iron cramps and anchors with jagged ends, copper, metal or slate dowels, etc., that may be deemed necessary by the architect, who will designate the positions, sizes and number of cramps to be used either in person or indicate on on detail or full size drawings.

Building.

The horizontal courses of stone work to be kept perfectly level throughout and the walls built uniformly, that is, one part of the walls must not be carried up more than 3 feet 6 inches before the remainder is brought to the same level, unless otherwise ordered by the architect or clerk of the works.

The stone must be set in proper consecutive order, and no detention or delay will be allowed on account of brickwork, backing, etc.

Protection During Construction.

The contractor will be required to protect with boards, etc., from injury during construction, all projections and angles of stone work of both basement and superstructure, platforms, steps, sills, jambs, etc., and also to cover the tops of stone work of walls with boards to protect them from rain, etc., and if considered necessary by the architect or clerk of the works, to cover them whenever leaving off work.

Chimney Caps.

The cap stones of chimneys and extraction shafts to be one stone each and perforated for flues and openings.

Backs of Sills, Jambs, etc.

Window sills to be sunk, weathered, throated and grooved for iron tongue, and the backs of the sills, jambs, etc., of door and window openings to be good bed work, square and true with the face, the backs of all cut stone to be pitched off to the depths shown, and wherever necessary to form a bond with the brick backing.

Plinths, etc.

The contractor will provide and set all the cut stone plinths (templates) for iron and stone columns, piers, bases, binders and caps; wall binders and bearing blocks for girders, trusses, and concentrated loads each to be of the dimensions and thickness as shown and figured on drawings, and to be of selected dense rock, chiselled margins and fine point dressed, exposed surfaces and fine bush hammered level beds.

The entrance steps and platform, flagging of area and coping of area walls to be selected dense stone, margin drafted and bush hammered.

The flagging around boiler room section to be of large platform stone, extending from wall of building to, and forming curb of roadway. Axed or sawed surfaces with drove margins, weathered (bevelled) joints thoroughly caulked with oakum and filled with cement mortar. Cut the holes for coal hole covers and ash hoist as provided by the contractor for the iron work.

Scamping Cut Stone.

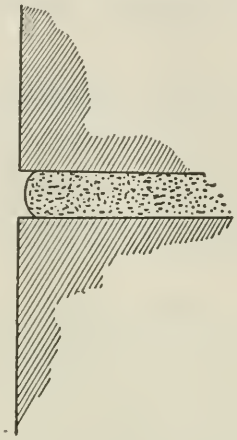
No scampering cut stone work, such as disguising cracks, chipped arrises and wants or hollows by means of composition will be allowed.

Scaffolding and Damage.

The contractor is to furnish all necessary power machinery, derricks, tackle, tools, scaffolding, (standards, ledgers, putlogs, scaffold boards and bracing), etc., necessary for the proper execution of this work, and will be held responsible for, and be required to make good at his own expense, any and all damage to completed or other works which may be done in the execution of his contract, or caused by the negligence of his workmen.

Cleaning Down and Pointing.

At completion of stone and brickwork of walls of building, the contractor will be required to wash down all exterior exposed stone work, rake out all joints, and point same with lime putty and sand, as near the colour of the stone as possible, the pointing to be finished as per sketch.



All cartage, hauling or removal of plant, materials, and rubbish to and from the site to be by, through, over and upon such streets or thoroughfares as may in that behalf be designated or directed by the Municipal Council of the City of Toronto, or by any officer or authority thereto authorized by said Council; but subject to any such designation or direction, all such cartage, hauling or removal shall be by, through, over or upon either St. Alban's Street, or the street known as East University Street, or so much of College Street as lies west of the main avenue leading into said Park from Queen Street.

The contractor is to take all proper and necessary means for the protection of the public and to be responsible for any damage to life, limb, or property occasioned by carrying out the works.

The contractor is to make good all adjoining premises, fences, walls, and other matters and things damaged, disturbed or made deficient during the execution of the works.

The contractor is to provide an office for the Clerk of the Works, with desk to lock, drawing boards, stool, brick fire-place, stove and flue complete and allow for attendance and coals and clear all away at the conclusion of works.

Sanitary Accommodation for the Workmen.

The contractor is, to the satisfaction of the Commissioner of Public Works, to erect and keep in repair, in the most secluded spot within walls, a w. c. shed, constructed of the necessary timber framing, sheathed with $1\frac{1}{8}$ inch plank, moulded, battened, and roof shingled, window to light same, entrance door strongly hung and fastened, and large ventilating shaft. Seating to accommodate at least twelve or more workmen, also a urinal trough. Under said seats construct a brick "catch" basin or receiver, four (4) feet wide by the length of space occupied by seats and two feet deep, pargetted both inside and outside, water-tight, provided with trap and waste, to have an 8-inch vitrified branch pipe waste connected to the hereinbefore specified temporary drain, provided with plug and pull. Said receiving and urinal basin to be supplied with water through $\frac{3}{4}$ inch black iron pipe with key cocks. Supply of receiver to be placed so as to have at least one foot deep or more of water in receiver.

The water bill and expense of keeping same clean and in repair, the first year to be borne by the contractor for the works covered by these specifications. The second year the water rate to be borne and paid jointly and equally with the contractor for carpenter

work. The third year one-fifth (1-5) of the water rates and full cost of keeping same clean and in repair to be borne and paid by the contractor for the works covered by these specifications, and upon completion of building he is to remove same from the premises. All rubbish that may accumulate during the progress of the building from all various trades works underway, to be removed as rapidly as same accumulates and at the completion leave all works and premises broom clean and perfect.

Decision of Architect to be Final.

The decision and certificate of the Architect upon plans, specifications, size, material or workmanship, to be final and binding on the contractor.

Finally.

The specifications and drawings are to be construed according to their full intent, meaning and spirit, when taken either separately or together. The drawings and specifications taken conjointly shall be deemed to explain each other, and be descriptive of the necessary works to be performed under the contract. But should there be any discrepancy or disagreement between the figuring on the drawings and the scale, or between the larger and smaller drawings, or between the descriptive writing on the drawings and the colouring, the wording of this specification shall take precedence in all cases. The figuring on the drawings shall be taken or followed in preference to the smaller scale drawings, and the descriptive writing in preference to the colouring, and should there be anything shown on the drawings and not described in this specification as the converse thereof, the work shall be fully executed and carried out as is drawn, shown, or described in both.

Should any work or materials be found after execution or payments made on the same, to be not as herein specified, or by the plans set forth, said work or materials shall be removed and the sum paid for same deducted from the following estimate after rejection, and when the said work or materials have been replaced by the contractor in accordance with the requirements of plans and specifications, the sum retained shall be paid with the following estimate.

If any damage occurs to the work or materials during the progress of erection, the work or materials damaged, shall be removed, and perfect work and materials replaced at the cost and charge of the contractor.

Generally.

The Commissioner of Public Works reserves the right of making any alterations in or additions to the drawings or works, which he may think proper without in any way whatever affecting the validity of the contract entered into by the contractor, and the value of such alterations or of any works, extra or otherwise occasioned thereby is to be added to, or deducted (as the case may be) from the amount to be paid under the contract at market rates; but the contractor will not be entitled to nor will he be allowed any payment or compensation whatsoever for or in respect of any such alteration or addition or any work, labour, material, or thing done, made, furnished or performed in connection with or by reason of any such alteration or addition or forming any part thereof, unless such alteration or addition and all work and labour connected therewith has and have been first sanctioned and authorized in writing by the Commissioner of Public Works, over his own signature, and before the execution of the work, and the price or amount (if any) payable therefor to the contractor settled, fixed and determined by the said Commissioner.

The contractor is, within one month from the date of his entering into his contract, to completely take down the old building now on or near the proposed site of the new building, and known as the old King's college building.

Such of the old material in said old building as may be considered fit by the Architect or Clerk of the Works may be re-used in the new buildings; but the remainder of said material shall be the property of the contractor, and shall, as fast as taken down, be at once removed by him from the site and outside of the Park, and failing to be so removed, the same may be procured to be done by the Commissioner of Public Works at the cost and expense of the contractor.

The contractor is to give all notices, obtain all licenses and pay all fees to all authorities and persons entitled thereto.

In these specifications the term or expression "Commissioner of Public Works" means the acting Commissioner of Public Works for the Province of Ontario, for the time being.

KNOW ALL MEN BY THESE PRESENTS, that we Lionel Yorke, of the city of Toronto, in the County of York and Province of Ontario, Contractor; James Farquhar, of the city of Toronto, in the County of York and Province aforesaid, Builder, and Robert Carroll, of the city of Toronto, in the County of York and Province aforesaid, Builder, are held and firmly bound unto Our Sovereign Lady Queen Victoria, her Heirs and Successors, in the penal sum of fifty thousand dollars of lawful money of Canada, for which payment, well and truly to be made, we and each of us, jointly and severally, bind ourselves, our and each of our Heirs, Executors, and Administrators, firmly by these presents.

Sealed with our Seals and dated the seventh day of October, in the year of our Lord one thousand eight hundred and eighty-six.

Whereas, by certain articles of agreement made and entered into on the seventh day of October, in the year of our Lord one thousand eight hundred and eighty-six, between the said Lionel Yorke, of the first part, and Her Majesty Queen Victoria, represented therein by the Honourable the Commissioner of Public Works, for the Province of Ontario, of the second part, the said Lionel Yorke did contract to perform certain work in the said articles of agreement mentioned, and in the specification thereto annexed, described, relating to the excavating, stone mason and bricklayers' and other works in connection with the erection of new Parliament and Departmental Buildings in the city of Toronto, in manner and according to the covenants, clauses, conditions, and stipulations therein contained, as will appear by the said articles of agreement hereunto annexed.

Now, the condition of this obligation is such that if the said Lionel Yorke, his heirs, executors, or administrators do, and shall well, truly and faithfully perform, observe, fulfil and keep all and singular the said covenants, stipulations and agreements, to be by him performed, observed, fulfilled and kept, as in the said articles of agreement, and in the specification contained, then this obligation shall be null and void, otherwise to be and remain in full force and virtue; and nothing that will not discharge the said Lionel Yorke from liability shall, either at law or in equity, discharge the above-bounden James Farquhar or Robert Carroll from liability under this bond or obligation.

In witness whereof, the parties to these presents have hereunto set their hands and seals, the day and year first above written.

(Signed) LIONEL YORKE, [Seal].
JAS. FARQUHAR, [Seal].
ROBT. CARROLL. [Seal].

Signed and sealed in the presence of WM. EDWARDS.

ARTICLES OF AGREEMENT

Made the seventh day of October in the year of our Lord one thousand eight hundred and eigty-six, in duplicate, between Lionel Yorke, of the City of Toronto, in the County of York and Province of Ontario, Contractor, hereinafter called the contractor of the first part, and Her Majesty Queen Victoria, represented herein by the Honourable Commissioner of Public Works for the Province of Ontario, under and by virtue of the Revised Statute respecting the Public Works of Ontario, chaptered thirty, of the second part,

witness that the contractor hereby binds himself, his heirs, executors and administrators, to and in favour of Her Majesty, her heirs and successors, for and in consideration of the covenants, conditions and agreements hereinafter contained, as follows :—

First.—The contractor, his executors, or administrators, will find all labour, tools, implements and materials whatsoever necessary for the due performance, execution, construction and completion of all and singular to works in the specifications hereunto annexed mentioned; and will deliver the whole of such works unto the Government of Ontario, on or before the first day of November, one thousand eight hundred and eighty-nine, fully and finally completed of the best materials of their several kinds, and finished in the best and most workmanlike manner, in the manner required by, and in strict conformity with the said specifications hereto appended, and the plans and drawings referring thereto (which said specifications, plans, and drawings are hereby declared to be and are made part and parcel of this contract), and to the complete satisfaction of the Commissioner and of the architect or other person in charge of the said works on behalf of the said Commissioner, save and except that instead of cement the contractor may use and substitute the very best quality of fresh-burnt quick-lime in lump, for the mortar of the common brickwork only, and that said common brickwork may be of modified English bond, having every fourth course a header course.

Second.—The said specifications, and the several parts thereof, and the plans and drawings therein referred to, shall be taken together to explain each other, and to make the whole, taken together, consistent; and if in the execution of the work, or any part thereof, it shall be found that anything has been omitted or misstated in the plans, drawing or specifications, which is necessary for the proper performance and completion of any part of the work contemplated, the contractor, his executors or administrators, shall at their own expense, execute the same as though it had been more particularly described, and provide whatever may be necessary to complete the whole in the best and most workmanlike manner, according to the true intent of the said specifications, plans and drawings and any addenda thereto; and the decision of the Commissioner of Public Works shall be final and conclusive between the parties as to such true intent; and the correction of any such omission or mis-statement shall not be taken to be or alleged or claimed to be an alteration in, or deviation from, the works hereby contracted for.

Third.—The contractor, his executors or administrators, shall not make any alteration in, addition to, or omission from the work described in the said specifications and as shown on the plans and drawings therein referred to, unless, before the making thereof, such alteration, addition, or omission, shall have been first approved or ordered by the Commissioner of Public Works, and communicated by him to the contractor in writing; and in the event of any alteration, addition, or ommission, either in the position or details of any part of the work being ordered in manner aforesaid, the contractor shall be bound to make such alteration, addition, or omission, and in the event of any such alteration, addition, or ommission being so made, the value of such alteration, addition, or omission shall be ascertained according to the schedule of prices hereto annexed (if any), and if no schedule of prices is hereto annexed, then by the judgment of the architect, or other person in charge as aforesaid; and the amount thereof shall be either added to or deducted from the amount of this contract as the case may require; and the decision of the Commissioner of Public Works, as to whether any such alteration constitutes an addition to or deduction from the work as contemplated by the said specifications, shall be conclusive between the parties hereto, and the certificates of the Commissioner shall be given accordingly; provided always that nothing in this clause contained shall be construed to make any correction of any error or omission in the said specifications, plans, or drawings referred to in the last preceding clause, an alteration in or deviation from this contract; and provided that no such alteration, addition or omission, whatever may be the extent or quality thereof, or at whatever time the same may be required pending this contract, shall in any wise have the effect of suspending or rescinding this contract, which shall continue to subsist notwithstanding any such alteration, addition, or omission.

Fourth.—The contractor, his executors or administrators shall not perform any work in the nature of extras, or any work not contemplated by the said specifications, plans and drawings, and shall not make any claim or bring any action or suit in respect of any matter or thing claimed or alleged to be such extras or extra, unless, before the performance of said work, the order therefor of the Commissioner of Public Works has been given in writing to the contractor; such extras or extra respectively shall then become incorporated with this contract, and shall be payable hereunder upon the certificates of the architect, or other person in charge, in the same manner and in the same proportions and at the same times respectively as payments for the work in the said specifications, plans and drawings mentioned are hereby agreed to be made; and in case no price therefor is specified in the order therefor, the same shall be ascertained according to the schedule of prices (if any) hereto annexed; or in case there is any work of a kind which is not mentioned in such schedule, or in case there is no schedule annexed thereto, then the price therefor shall be what the architect, or other person in charge, as aforesaid, may consider the same reasonably worth.

Fifth.—If the contractor shall become bankrupt or insolvent, or shall compound with his creditors, or propose any composition to his creditors for the settlement of his debts, or shall commit any act of insolvency, or shall attempt to transfer, sub-let or assign this contract, or any part thereof, or if by the report of the architect, or person in charge, employed by the said Commissioner in that behalf, it shall appear that the rate of progress of the said works is not such as to ensure the completion of the same within the time herein prescribed, or within any additional time which may have been grated as hereinafter provided; or in case no additional time has been granted, and the said works are not completed within the time before limited; or in case of additional time as aforesaid, then if the same are not completed within such additional time, or if the contractor shall persist in any course violating any of the provisions of this contract, Her Majesty shall have the power, at her discretion, by the said Commissioner aforesaid, without previous notice and without process or suit at law, to take the work or any part thereof out of the hands of the contractor, and either to re-let the same to any other person or persons, without its being previously advertised, or to employ workmen, and provide materials, tools and other necessary things at the expense of the contractor, or to take such other steps as he may consider necessary, in order to secure the completion of the said work; and the contractor in either case shall be liable for all damages and extra expenditure which may be incurred by reason thereof; and shall in either of such cases likewise forfeit all moneys then due under this contract: Provided always that if any balance on the amount of this contract remains after completion in respect of work done during the time of the defaulting contractor the same shall belong to him or the person legally representing him.

Sixth.—All materials for the said work shall, before being used, be inspected and approved of either by the said Commissioner or by such person as he may appoint, and any material disapproved of shall not be used in the work; but it is distinctly agreed that the inspection and approval of materials shall not in any wise subject Her Majesty to pay for the said materials, or any portion thereof, unless employed or used in the said work, nor prevent the rejection afterwards of any portion thereof which may turn out to be unsound or unfit to be used in the work; nor shall such inspection be considered as any waiver or objection to the work on account of the unsoundness or imperfection of the materials used.

Seventh.—In case any material not corresponding with the said specifications, or, in the opinion of the architect, or other person in charge of the said works, not sufficiently sound or suitable for the said works, shall at any time be brought to the intended works, or any part thereof, it shall be lawful for the architect, or other person in charge of the said works, to require the contractor, his executors or administrators, to remove the same from off Her Majesty's property, and to provide sound and suitable materials in accordance with the said specifications and to the satisfaction of the said Architect, or other person in charge as aforesaid; and in case any part of the said works shall have been executed in an improper manner as regards the workmanship, or with unsound or unsuitable

materials, not in accordance with the said specifications, plans and drawings, or the instructions given by the said architect, or other person in charge as aforesaid, it shall be lawful for the Commissioner, or for such architect, or other person as aforesaid to require the contractor, his executors or administrators, to take down and remove such part or parts of the work so improperly executed, and to re-execute the same in a good, sound and workmanlike manner; and if, after seven days' notice to the contractor, his executors or administrators, or their foreman of the works, such unsound or unsuitable material shall not be removed from off Her Majesty's property by the contractor, his executors or administrators, it shall be lawful for the Commissioner, or for the architect, or other person in charge of the said works, to cause the same to be removed to such place or places as he shall think fit; and if, after twenty-four hours' notice to the contractor, his executors or administrators, or their foreman, such works so improperly executed shall not have been taken down and removed, it shall be lawful for the said Commissioner or for the architect, or other person in charge of the said works, to cause the same to be taken down and removed to such place or places as he may think fit, and the work to be re-executed by such workmen as he shall think competent, and in a manner in accordance with the said specifications or the instructions of the Commissioner, or of such architect or other person in charge as aforesaid, from time to time given without any liability on his part or on that of Her Majesty for any loss that may arise to the contractor, his executors or administrators, or damage which may happen to the works in removing such improper materials, or in taking down and removing such improper works, or in substituting other materials, or in causing the work to be re-erected in a more workman-like manner; but in any of such cases the contractor, his executors or administrators, shall pay all such costs, charges and expenses as shall be incurred in the removal of such materials or the substitution of other materials, or in the re-erection of the said works; and the costs, charges and expenses attending the same shall be deducted from the amount of this contract.

Eighth.—It shall be in the power of Her Majesty to make payments or advances on materials, implements, vessels or tools of any description procured for the works, or used or intended to be used about the same, in such cases and upon such terms and conditions as to the said Commissioner may seem proper; and whenever any advance or payment shall be made to the contractor upon any materials, implements, vessels or tools of any description, the materials, implements, vessels or tools upon which such advance or payment shall be made, and also all and any other materials, implements, vessels or tools of any description which may be placed upon property belonging to Her Majesty, or upon any street or road in the neighbourhood of the said works, for the purpose of being used about the said works, shall henceforth be vested in and held as collateral security by Her Majesty, her heirs and successors, for the due fulfilment by the contractor of the present contract; and the same or any of them may be used by the Commissioner in the completion of the said works; it being, however, understood that all such materials, implements, vessels, or tools of any kind, are to remain at the risk of the contractor, who shall be responsible for the same until finally used and accepted as part of the work by the said Commissioner; but the contractor shall not exercise any act of ownership or control whatever over any such materials, implements, vessels or tools, except for the purpose of the said works, without the permission in writing of the said Commissioner, or the architect, or person in charge.

Ninth.—Should any overseer, mechanic, or workman employed on or about the work, give any just cause of complaint, the contractor shall, immediately upon the application of the said Commissioner, or of the architect, or person in charge, dismiss such person forthwith from the works, and he shall not be employed again thereon without the consent in writing of the said Commissioner, or of the architect, or person in charge; and should the contractor continue to employ, or should he again employ about such works, without such consent, such overseer, mechanic, or workman, the contractor shall pay and forfeit to Her Majesty, her heirs and successors, the sum of twenty dollars lawful money of Canada for each day during which such overseer, mechanic, or workman shall be employed on the works after such application as aforesaid, as and for all liquidated damages in respect

thereof; and all sums so forfeited may be deducted from the amount which the contractor may be entitled to receive from Her Majesty, at the commencement of the month next ensuing such forfeit, or at a later period, as Her Majesty shall deem proper.

Tenth.—The contractor shall not in any way, without the consent in writing of the Commissioner, dispose of assign, sub-let, or re-let any portion of the work embraced in this contract, except the procuring of materials.

Eleventh.—Should any difference of opinion arise as to the construction to be put upon any part of the specifications, plans, or drawings, the same shall be determined by the Commissioner of Public Works, and such determination shall be final and conclusive, and binding upon the parties to this contract, and every of them.

Twelfth.—Any notice or other paper connected with these presents, which may be required or desired on behalf of Her Majesty, to be served on the contractor, may be addressed to the contractor, at his domicile or usual place of business, or at the place where the work hereby contracted for is carried on, and left at the Post-office, in the City of Toronto, and any paper so addressed and left at the said Post-office shall, to all intents and purposes, be considered legally served.

Thirteenth.—Should the contractor not complete the work herein contracted for at the period agreed upon, as above mentioned, the contractor shall be liable for and shall cause to be paid to Her Majesty all salaries or wages which shall become due to the person or persons superintending the work on behalf of the said Commissioner, from the above named period for completion until the same shall actually be completed and received, and shall also pay to Her Majesty one hundred dollars per week as liquidated damages (over and above such salaries or wages) for every week beyond the expiration of that period, and the Commissioner, for and on behalf of Her Majesty, may deduct such salaries, wages, and damages from any moneys payable to the contractor in respect of this contract.

Fourteenth.—In case any workman employed by the contractor on the said works are unpaid at the time the Commissioner takes possession of the works, or at any other time, either on account of the default of the contractor or otherwise, it shall be lawful for the Commissioner, acting for Her Majesty, to pay such workmen the amount which may be owing to them, and charge the same against the contractor.

Fifteenth.—If by reason of any additions or alterations to the works, or for want or alleged want or deficiency of any orders, drawings, or directions, or by reason of any difficulties, impediments, obstructions, oppositions, doubts, disputes, or differences whatsoever and howsoever occasioned, the contractor shall, in the opinion of the architect, or other person in charge, have been unduly delayed or impeded in the completion of his contract, it shall be lawful for the Commissioner to grant from time to time, in writing under his hand, such extension of time, and to assign such other day or days for completion as to him may seem reasonable, without thereby prejudicing or in any manner affecting the validity of this coutract, and any and every such extension of time shall be deemed to be in full compensation and satisfaction for or in respect of any and every actual and probable loss or injury sustained or sustainable by the contractor in the premises, and shall in like manner exonerate him from any claim or demand on the part of Her Majesty, for or in respect of the delay occasioned by the causes or cause in respect of which any and every such extension of time shall have been made, but not further, or otherwise, or for or in respect of any delay continued beyond the time mentioned in such writing or writings respectively. And it is hereby expressly declared that in case the contractor does not procure in writing from the Commissioner, as aforesaid, an extension of time for the completion of the said works, or any portion thereof, it shall be conclusively presumed that the contractor is not entitled thereto.

Sixteenth.—No works hereby contracted to be executed shall be deemed to have been executed, nor shall the contractor, his executors or administrators, be entitled to payment

therefor, unless the same shall have been executed to the satisfaction of the architect, or other person in charge of the said work, as aforesasd, and shall have been certified by him to have been so executed.

Seventeenth.—Her Majesty, represented as aforesaid, in consideration of the premises and of the covenants herein contained on the part of the contractor, his executors or administrators, hereby covenants with the contractor, his executors and administrators, that Her Majesty will pay to the contractor, his executors or administrators, for and in respect of the works in the said specifications, plans, and drawings mentioned and hereby contracted to be executed, and the materials and articles to be provided and used in the execution and performance of such works, the sum of six hundred and seventy-one thousand and two hundred and fifty dollars by monthly payments and in the proportions following, that is to say, within fifteen days after a certificate shall be made and signed by the Commissioner and by the architect, or other person in charge, as aforesaid, for the amount due at the close of the preceding month, after making due allowance for all additions, or deductions as aforesaid, less the sum of ten per cent. reserved until the completion of the said work, and will pay the balance which may remain due to the contractor, his executors or administrators, on completion by him or them of the said works, within one calendar month next after the architect, or other person in charge of such works shall have certified in writing, under his hand, that the same are completed in accordance with the terms of this contract to his complete satisfaction, if the said Commissioner shall so soon have accepted and approved of the work, and shall also in like manner have certified what balance, after making due allowance for all such additions or deductions as aforesaid (as the case may be), is due under this contract, to the contractor, his executors or administrators, and after making all proper charges against the contractor, his executors or administrators, in accordance with the terms of this contract; and Her Majesty will by like monthly payments, and upon like certificates, and in like proportions, and subject to the like allowances and charges, pay to the contractor, his executors or administrators, for any such extras as aforesaid, the prices or sums in that behalf hereinbefore provided by the contract authorizing such extras; but in forming a final estimate, the Commissioner and the architect, or other person in charge, shall not be bound or governed by the preceding monthly estimates, which shall be considered merely as approximate: Provided always, and it is further agreed, that Her Majesty, from time to time during the progress of the work, may pay to the contractor the whole or any portion of the ten per cent. so withheld and retained.

Eighteenth.—No works whatever claimed to be executed by the contractor and claimed by the contractor to be outside of the preceding terms of this contract, and which are executed or are to be used in connection with the works contemplated by this contract, or any of them shall be deemed to be executed, nor shall the contractor, his executors or administrators, be entitled to payment therefor, unless the same shall have been executed to the satisfaction of the Commissioner and of the architect or other person in charge of the works contemplated by this contract, and shall have been certified by them to have been so executed; and the amount payable to the contractor in respect thereof shall be paid within fifteen days after a certificate shall be made and signed by the Commissioner and by the architect, or other person in charge, certifying the amounts due to the contractor in respect of such work.

Nineteenth.—In case the said Commissioner shall take the works, or any part thereof, out of the hands of the contractor then, upon the completion of the works herein provided for, the said Commissioner shall certify what, if anything, shall remain due to the contractor in respect of the said works, after making due allowance for all additions to be allowed to, or deductions or charges to be borne by, the contractor under the provisions of this contract, or shall certify what, if anything, shall be owing to Her Majesty in respect thereof; and the contractor and Her Majesty, respectively, shall abide by the certificate to be read as aforesaid, and shall forthwith pay the amount found to be owing in respect of the said works.

Twentieth.—Should the amount now voted for this service by the Legislature be at any time expended previous to the completion of the work now contracted for, the contractor may or not, on receiving a notice in writing from the said Commissioner to the above effect, stop the work; but in any case the contractor shall not be entitled to any further payment for work done, after the service of the notice above referred to, until the necessary funds shall have been voted by the Legislature; nor shall the contractor have any claim for compensation or damages for the said suspension of payment, or for any stoppage or delay in the prosecution or finishing of the works as aforesaid.

Twenty-first.—And whereas it is estimated that thirteen and one-half millions of kiln run of common brick will be required by the contractor to enable him to complete the said works according to said specifications Her Majesty, represented as aforesaid, and in consideration of the premises, hereby covenants and agrees that in addition to paying to the contractor as aforesaid, the said sum of six hundred and seventy-one thousand and two hundred and fifty dollars, Her Majesty will, from the brick yard known as the Central Prison brick yard in the city of Toronto, supply and deliver to the said contractor, and the contractor, in consideration of the premises agrees that he will receive and accept at the kiln in said brickyard, and from time to time as common brick may be required in and for the construction and performance of the works hereby undertaken by the contractor, thirteen and one-half millions of merchantable common brick, to be delivered, taken and calculated as delivered on the ground to the teamsters of the contractor and as kiln run, it being further understood and agreed by and between Her Majesty and the contractor, that each kiln of such brick when ready to be so delivered to the contractor shall, upon notification in that behalf to him by the Commissioner or by any other person for that purpose named by the Commissioner, be forthwith accepted and entirely removed by the contractor from said Central Prison brickyard and grounds, (2) that if to complete the said works according to and as required in and by said specifications less than thirteen and one-half millions of merchantable common brick, kiln run as aforesaid, will be required, Her Majesty will pay to the contractor the sum of six dollars for each and every thousand of the said thirteen and one-half millions which will, on the completion of the said works, not have been delivered as aforesaid to the contractor, and (3) that none of the said thirteen and one-half millions of brick shall by the contractor be used or employed in the completion and construction of the said works that do not in all respects comply with the requirements of the said specifications.

Twenty-second.—It is hereby expressly agreed that this contract is made subject to the condition that the same shall be ratified by resolution of the Legislative Assembly of Ontario, at its next session: Provided always that should the same be not so ratified, any work done or materials furnished under the said contract, by the contractor prior to said session shall, nevertheless, be paid for in accordance with the terms thereof.

Twenty-third.—In these articles of agreement the term or expression "the Commissioner," and the term or expression "said Commisssoner," and the term or expression "Commissioner of Public Works," mean respectively the acting Commissioner of Public Works for the Province of Ontario for the time being.

In witness whereof the party of the first part, and the said Commissioner representing Her Majesty as aforesaid, have hereunto signed their names and set their seals on the day and year first above written.

Signed and sealed by the said party of the first part, in presence of Wm. Edwards. } LIONEL YORKE. [S.]

Signed and sealed by the said Commissioner of Public works, in presence of Wm. Edwards. } C. F. FRASER, Commissioner of Public Works for Ontario. [S.]

NOTICE TO CONTRACTORS.

Sealed tenders addressed to the undersigned, and endorsed "Tenders for Parliament Buildings," will be received at this Department until twelve of the clock, noon, on Thursday, the 16th day of February next, for the erection and completion of New Parliament Buildings for Ontario, and certain works in connection therewith according to (1) the Plans and Specifications prepared by Messers. Gordon & Helliwell, Toronto, or (2) the Plans and specifications prepared by Messrs. Darling & Curry, of the same city.

Printed forms of tender can be obtained at this Department, and persons tendering are specially notified that they will not be entitled to have their tenders considered unless the same are made on and in compliance with these printed forms, signed with the actual signature of every person tendering (including each member of a firm), followed by his post-office address, and with all blanks in the forms properly filled up.

Each tender must be accompanied by an accepted bank cheque, payable to the order of the Commissioner of Public Works for Ontario, for the sum of $5,000 which will be forfeited if the party tendering declines or fails to enter into a contract based upon such tender when called upon to do so. Where the party's tender is not accepted, the cheque will be returned. Where two tenders, (*i. e.*, one based on each set of said plans and specifications) are made under the same cover by the same person or firm, only one such accepted bank cheque need accompany said two tenders.

For the due fulfilment of the contract, satisfactory security will be required on real estate, or by the deposit of money, public or municipal securities or bank stock, to the amount of five per cent. on the bulk sum, to become payable under contract, of which five per cent. the amount of the accepted cheque accompanying the tender, will be considered a part.

To each tender must be attached the actual signatures of at least two responsible and solvent persons, residents of Ontario, willing to become sureties for the carrying out of these conditions and the due fulfilment and performance of the contract in all particulars.

Printed copies of the respective specifications can be obtained on application at the Department by Friday, the sixth instant.

This Department will not be bound to accept the lowest or any tender.

By order,

WM. EDWARDS,
Secretary.

Department of Public Works for Ontario,
Toronto, 2nd January, 1882.

SCHEDULE OF TENDERS

Received in the year 1882, for the erection of New Parliament Buildings, according to plans of Messrs. Gordon and Helliwell.

NAMES OF CONTRACTORS.	P. O. ADDRESS.	AMOUNT OF TENDERS.
Brown and Love	Toronto	$542,000 00
Robert Snarr	"	556,726 00
J. P. Wagner & Co.	"	578,000 00
Alexander Manning	"	580,000 00
H. J. Beemer	Montreal	585,000 00
Lionel Yorke	Toronto	617,500 00
Power, Ough, McCraney & Co.	"	619,000 00
George Ball	Barrie	665,397 00
John Herbert	Toronto	727,545 00
Alex. J. Brown	Hamilton	748,475 00

WM. EDWARDS,
Secretary.

DEPARTMENT OF PUBLIC WORKS FOR ONTARIO,
TORONTO, February 20th, 1882.

SCHEDULE OF TENDERS

Received in the year 1882, for the erection of New Parliament Buildings, according to plans of Messrs. Darling and Curry.

NAMES OF CONTRACTORS.	P. O. ADDRESS.	AMOUNT OF TENDERS.
Brown and Love	Toronto	$612,000 00
J. P. Wagner & Co.	"	626,000 00
Robert Snarr	"	626,138 00
Lionel Yorke	"	703,000 00
H. J. Beemer	Montreal	719,190 00
George Ball	Barrie	755,000 00
Power, Ough, McCraney & Co.	Toronto	834,000 00
Alexander Manning	"	875,000 00
Alex. J. Brown	Hamilton	925,000 00

WM. EDWARDS,
Secretary.

DEPARTMENT OF PUBLIC WORKS FOR ONTARIO,
TORONTO, February 20th, 1882.

(No. 29).

Return to an Address to His Honour the Lieutenant-Governor, praying that he will, in his capacity as visitor of the Western University of London, Ontario, call upon the Senate of said University to furnish a full and accurate account of the property of the University, and the income received therefrom, in order that the same may be laid before the Legislature, as directed by section 5, of 41 Vic., cap. 20. *(Not printed).*

(No. 30).

Return shewing the total number of Students in University College at the date of the Order; the number of female students at the same date, and also, the number of students attending lectures in each of the following subjects:—Greek, Latin, Mathematics, Physics, History, Ethnology, English, French, German, Italian, Spanish, Hebrew, Chaldic, Syriac, Logic, Mental and Moral Science, Biology, Chemistry, Mineralogy and Geology. *(Not printed).*

(No. 31).

Return shewing on a map or plan each timber limit or berth now under license, and each timber limit or berth disposed of at the sale in October last, whether yet under license or not, with the names of the present licensees or owners thereof marked thereon, and the area thereof, and the bonus *per* square mile paid in respect thereof, and the dates when the same were respectively first placed under license. *(Not printed).*

(No. 32).

Return shewing the names of the persons, firms and companies, indebted to the Province on the first day of January, 1886, on account of Timber Dues, Ground Rent, or Bonuses for Timber Limits, the amount of indebtedness in each case, the balance, if any, due by such persons, firms and companies, on the first day of January in each year since 1880. The total amount of such indebtedness on the 1st day of January, 1886. *(Not printed).*

(No. 33).

Return shewing the persons by whom, and the limits or berths in respect of which, the bonuses appearing as accruals from Woods and Forests, were payable in each year since 1871, the balances which remain unpaid on account of bonuses on the 31st December, in each year since 1871, with the names of the persons by whom the same were respectively owing, and the amount owed by each of them, and in respect of what limit or berth it was due, and the period during which it had remained unpaid after it became due, the amounts which in each of the said years were allowed to licensees in reduction of the sums owing by them, with the names of the persons to whom the allowances were made, the amount of each allowance and the reasons for making them. *(Not printed.)*

RETURN

To an address of the Legislative Assembly to the Lieutenant-Governor, passed on the 10th day of March, 1886, praying that he will cause to be laid before the House a Return of Copies of all Orders in Council relating to the sale of timber limits which took place in October last, the names of the purchasers at the sales, the several limits bought by each purchaser, with the area of each of them and the bonus per square mile agreed to be paid for each such limit; the deposit paid by each purchaser, the amount since paid on each purchase, and the nature of the security, if any, given for the residue of the price; the several limits which had been bid off at the sale which took place in October, 1872, and the price per square mile at which they were severally bid off at the sale; the names of all purchasers who have failed to comply with the conditions of sale; the names of all purchasers who have transferred their claims to other persons, with the names of the transferees, and dates of transfers to them respectively, the several limits, if any, put up for sale and not sold and the disposition since made of them and the authority under which such disposition was made. The upset or reserved price put on each limit offered for sale.

A. S. HARDY,
Secretary.

Provincial Secretary's Office,
Toronto, March 14th, 1887.

(*Mr. Meredith.*)

Copy of an Order in Council approved by His Honour the Lieutenant-Governor, the 16th day of July, 1885.

The Committee of Council have had under consideration the annexed report of the Honourable the Commissioner of Crown Lands, with reference to the sale of certain timber limits on the north shore of Lake Huron and advise that the same be acted upon.

Certified,

J. G. SCOTT,
Clerk Executive Council,
Ontario.

The Honourable
The Commissioner of Crown Lands.

The Commissioner of Crown Lands has the honour to report to the Lieutenant-Governor in Council,

That at the sale of Timber Berths on the north shore of Lake Huron, in October, 1872, there were a number of broken fronted spaces on the shore of the lake which were not offered for sale; the berths disposed of at the time being projected townships of rectangular form and of area approximately defined; the unsold spaces are situated along the shore of the lake, between French River on the east and the Township of Cobden on the west, frequently at long distance apart, and are bounded on the rear (north) by berths under license and in several instances on the east and west by Indian Reserves held under license from the Dominion Government.

There are also Timber Berths numbers 11, 13, 21, 62, 77, 79, 86, 87, 91, 116, 150, 154, 155 and 185 of the sale of 1872, which were bid in by parties who failed to comply with the conditions of sale, and consequently the berths remain unlicensed; these lands are also surrounded by licensed territory, and are, with spaces above referred to, subject to be cut upon in trespass and to devastation by forest fires.

Since the sale of 1872, till now, the risk of loss to the revenue from trespass on the berths and spaces in question has been slight owing to the limited extent of lumbering in the district, but from the fact that berths held by parties who have never worked them, have of late passed into the hands of practical lumbermen who may be expected to operate on them, the danger of illegal cutting, accidental or otherwise, on unlicensed lands abutting on berths under license, will be increased, especially where the outlines of the latter have not been surveyed.

In view of the fact that the unlicensed lands to which reference is made, are scattered among and surrounded by lands covered by license, and that a very large outlay would be required to detect and prevent tresspass in a territory so extensive, the Commissioner is of opinion that the lands in question should be placed under timber license, when the ordinary wood-ranging arrangements now in force, would be sufficient for supervision of operations and the risk from forest fires materially lessened by the exercise of care by licensees in guarding their interests. The Commissioner therefore recommends that he be authorized to dispose of the right to cut the timber on the lands herein mentioned by public sale, at such time and place and on such terms and conditions as he may consider advisable.

T. B. PARDEE,
Commissioner.

Department of Crown Lands,
Toronto, 14th July, 1885.

A Return ordered by the Honourable the Legislative Assembly, the 10th March, 1886, of Copies of all Orders in Council relating to the sale of timber limits which took place in October last, the names of the purchasers at the sale, the several limits bought by each purchaser, with the area of each of them and the bonus per square mile agreed to be paid for each such limit; the deposit paid by each purchaser, the amount since paid on each purchase, and the nature of the security (if any) given for the residue of the price; the several limits which had been bid off at the sale which took place in October, 1872, and the price per square mile at which they were severally bid off at that sale; the names of all purchasers who have failed to comply with the conditions of sale; the names of all purchasers who have transferred their claims to other persons, with the names of the transferees and dates of transfers to them respectively; the several limits (if any) put up for sale and not sold, and the disposition since made of them, and the authority under which such disposition was made.

Names of Purchasers.	No. of berth.	Area in square miles.	Bonus per square mile.	Names of Purchasers who have transferred their claims to other persons.	Names of the Transferees.	Dates of transfers.
			$ c.			1885.
Hugh McDonald	1	27¾	250 00	Hugh McDonald	Barnet & Mackie	Oct. 22.
John Payne	2	68	1,250 00	John Payne	Mossom, Boyd & Co.	Oct. 24.
Arthur Hill	3	53	250 00			
F. B. Maxwell	4	50	60 00			
W. H. Bennett	5	59	350 00	W. H. Bennett	Jas. L. Burton	Oct. 22.
Ontario Lumber Co.	7	63	120 00			
W. H. Bennett	8	13½	1,200 00	W. H. Bennett	Jas. L Burton	Oct. 22.
Robert Jaffray	9	11	480 00	Robert Jaffray	Collins Inlet Lumber Co.	Nov. 9.
John Scully	10	83	150 00			
John Waldie	11	28	710 00	John Waldie	J. & T. Chalton	Oct. 23.
Mossom Boyd	12	23	710 00			
John Scully	13	26	240 00			
"	14	24¾	320 00			
John M. Dollar	15	15	100 00			
Charles Sereney	16	36	250 00	Charles Sereney	Alexander Fraser	Oct. 23.
Thomas Charlton	20	36	400 00	Thomas Charlton	J. & T. Charlton	Oct. 23.
Alexander McNabb	21	36	210 00	Alexander McNabb	Barnet & Mackie	Oct. 24.
Charles Sereney	22	36	250 00	Charles Sereney	Alexander Fraser	Oct. 23.
Alexander Sutherland	23	36	200 00	Alexander Sutherland	W. F. Whitney	Oct. 22
Conlin Brothers	24	36	580 00			
Samuel Lount	25	36	260 00	Samuel Lount	Cook Brothers	Oct. 29.
"	27	25½	225 00	"	"	Oct. 29.
"	29	7½	320 00	"	"	Oct. 29.

TIMBER BERTHS sold at sale of 22nd October, 1885, grouped in names of present owners, to shew deposits paid by each purchaser (or present owner), the amounts since paid on each purchase, and nature of security (if any) for the residue of the price.

NAMES OF OWNERS.	Nos. of berths.	Total amount of purchase.	Amount deposited.	Amount since paid.	Nature of security for residue of prices.
		$ c.	$ c.	$ c.	
Barnet & Mackie	1	6,937 50			
"	21	7,560 00			
		14,497 50			
Ground rent for season 1885-6.		128 00			
		14,625 50	9,585 50	5,040 00	
Mossom Boyd & Co	2	85,000 00			
"	12	16,330 00			
		101,330 00			
Ground rent for season 1885-6		182 00			
		101,512 00	25,514 50	25,332 50	
Arthur Hill	3	13,250 00			
Ground rent for season 1885-6		106 00			
		13,356 00	13,356 00		
Cook Brothers	25	9,360 00			Berths are held unlicensed till payments have been made in full.
"	27	5,737 50			
"	29	2,400 00			
		17,497 50			
Ground rent for season 1885-6		140 00			
		17,637 50	17,637 50		
F. B. Maxwell	4	3,000 00			
Ground rent for season 1885-6		100 00			
		3,100 00	3,100 00		
James L. Burton	5	20,650 00			
"	8	16,200 00			
		36,850 00			
Ground rent for season 1885-6		146 00			
		36,996 00	9,358 50	9,212 50	
Ontario Lumber Co	6	3,650 00			
"	7	7,560 00			
"	15	1,500 00			
"	17	3,600 00			
"	18	3,600 00			
		19,910 00			
Ground rent for season 1885-6		446 00			
		20,356 00	5,423 50	4,977 50	

TIMBER BERTHS sold at sale of 22nd October, 1885, etc.—*Continued.*

NAMES OF OWNERS.	Nos. of berths.	Total amount of purchase.	Amount deposited.	Amount since paid.	Nature of security for residue of price.
		$ c.	$ c.	$ c.	
Collin's Inlet Lumber Co.....	9	5,280 00			
Ground rent for season 1885-6 .	.....	22 00			
		5,302 00	5,302 00		
John & Thomas Charlton	11	19,880 00			
"	20	14,400 00			
		34,280 00			
Ground rent for season 1885-6 .	.....	128 00			
		34,408 00	17,268 00	17,140 00	
Conlin Brothers	24	20,880 00			
Ground rent for season 1885-6 .	.....	72 00			
		20,952 00	5,292 00		
Alexander Fraser.....	16	9,000 00			
"	22	9,000 00			
		18,000 00			* Berths are held unlicensed till payments have been made in full.
Ground rent for season 1885-6 .	.....	144 00			
		18,144 00	18,144 00		
Morris Quinn.....	19	3,600 00			
Ground rent for season 1885-6 .	.....	72 00			
		3,672 00	3,672 00		
W. F. Whitney	23	7,200 00			
Ground rent for season 1885-6 .	.....	72 00			
		7,272 00	7,272 00		
Williams & Murray	26	2,700 00			
Ground rent for season 1885-6 .	.....	54 00			
		2,754 00	1,404 00		
Joseph S. Smithson.....	10	12,450 00			
"	14	7,920 00			
		20,370 00			
Ground rent for season 1885-6 .	.....	216 00			
		20,586 00	20,586 00		

LIMITS put up for sale and not sold, the disposition since made of them, and the authority under which such disposition was made.

The following berths were offered for sale but withdrawn, namely:—Berths Nos. 6, 17, 18, 19, 26, 28.

At the close of the sale the auctioneer was requested by the Commissioner of Crown Lands to announce that parties desiring to purchase the withdrawn berths at the upset price put upon them would have an opportunity of doing so by calling next day at the Department, accordingly the following were disposed of:—

Berth No. 6,	73	sq. miles,	to	the Ontario Lumber Co.,	at $ 50	per sq. miles.
" 17,	36	"	to	"	at 100	"
" 18,	36	"	to	"	at 100	"
" 19,	36	"	to	Morris Quinn	at 100	"
" 26,	27	"	to	Williams & Murray	at 100	"

Together with the following, knocked down to John Scully, but resumed as the purchaser failed to comply with the conditions of sale.

Berth No. 10,	83	sq. miles,	sold to	Joseph S. Smithson,	at $150	per sq. mile.
" 14,	24¾	"	sold to	"	at 320	"

Being the prices at which they were bid off at sale to Mr. Scully.

The only berths remaining unsold of those offered for sale 22nd October, 1885, are Nos. 13 and 28.

The several limits which had been bid off at the sale which took place in October, 1872, and the price per square mile at which they were severally bid off at that sale.

No. of Berth. Sale of October, 1872.	No. of Berth. Sale of October, 1885.			
11	16	Sold in October, 1872,	at $ 70	per square mile.
13	17	"	at 130	"
21	18	"	at 115	"
62	19	"	at 90	"
77	28	"	at 75	"
79	20	"	at 45	"
86	21	"	at 60	"
87	22	"	at 60	"
91	23	"	at 170	"
116	24	"	at 90	"
150	25	"	at 195	"
154	26	"	at 240	"
155	27	"	at 225	"
185	29	"	at 280	"

AUBREY WHITE,
Assistant Commissioner.

DEPARTMENT CROWN LANDS,
TORONTO, 10th February, 1887.

REPORT

Of the Commissioners appointed to Revise and Consolidate the Public Statutes of the Province of Ontario, 1887.

Presented to the Legislative Assembly.

By Command.

ARTHUR S. HARDY,
Secretary.

Provincial Secretary's Office,
Toronto, 11th March, 1887.

REPORT

OF THE COMMISSIONERS APPOINTED TO REVISE AND CONSOLIDATE THE PUBLIC STATUTES OF THE PROVINCE OF ONTARIO, 1887.

His Honour

The Honourable JOHN BEVERLEY ROBINSON,

Lieutenant-Governor of the Province of Ontario.

The Commissioners appointed to revise and consolidate the Public Statutes of the Province of Ontario have the honour to submit a draft of the work entrusted to them.

In the preparation of this work the Commissioners have preserved as far as possible the arrangement of the Revised Statutes of Ontario, 1877.

They have endeavoured to include in one chapter those Acts which pertain to the same subject, to harmonize conflicting enactments, to adopt uniformity of language, to remove redundancies of expression, and so present the law in a concise and simple form.

The better to carry out this intention, there have been eliminated most of the enactments which were merely matters of procedure, and these are being reviewed and consolidated by the Judges under the Judicature Act as Rules of Court.

The Commissioners have directed a table to be prepared, shewing those sections of the proposed consolidation which by a change of language vary or amend the existing law. Most of these changes are made more effectually to carry out what is considered to be the object and intention of the Legislature.

The clauses of the Statutes pertaining to matters constituting indictable offences, and which in the Revised Statutes of Ontario, 1877, are printed in small type, have been for the most part omitted.

GEO. H. BURTON,
Chairman.
C. S. PATTERSON,
J. A. BOYD,
F. OSLER,
JOHN E. ROSE,
JOHN O'CONNOR,
JOSEPH E. McDOUGALL,
O. MOWAT,
ALEXANDER MORRIS,
ARTHUR S. HARDY,
J. G. SCOTT,
JOHN R. CARTWRIGHT,
F. J. JOSEPH.

TORONTO, March, 1887.

REPORT

Of the Commissioners for Niagara Falls Park, 1887, presented to the Legislative Assembly.

By command,

A. S. HARDY,
Secretary.

Provincial Secretary's Office,
Toronto, 11th March, 1887.

REPORT

OF THE COMMISSIONERS FOR NIAGARA FALLS PARK, 1887.

To the Honourable ARTHUR S. HARDY, Q.C., M.P.P.,
Secretary of the Province of Ontario.

SIR,—The Commissioners beg to report that the Arbitrators in the references made to them for the valuation and payment of lands taken for the Niagara Falls Park, have made their awards in all cases except two, one being the case of Mr. J. T. Bush, where a second reference became necessary.

This case has been heard, and although the Commissioners have not yet received the award, they have no reason to fear that the amount will be in excess of that originally awarded. The second case is that of the Thorold, St. Catharines and Suspension Bridge Road, respecting which provision has been made in the Act about to be submitted to the Legislature, providing for the contingency that had arisen in this case, which the Commissioners have every reason to believe will not alter the amounts already awarded.

The amounts awarded to the respective proprietors and the amounts offered by the Commissioners, are as follows :—

OWNER'S NAME.	Awarded.	Valuations and offers made by Commissioners.
	$	$
Bush	34,000	27,500
Lyman, Moore	2,900	1,675
Tench, E. A.	8,000	5,500
Tench, John	1,500	1,000
Robinson, Eliz.	3,600	3,500
" W.	3,600	3,500
Brundage	15,050	11,388
Buchanan, W. O.	21,767	17,861
Wood, Peter	14,000	11,400
Newton, W.	400	400
Clarke, P. S.	2,500	1,500
Buchanan, Estate of James	1,550	1,000
" " R. S.	6,600	7,120
Davis, Saul	102,500	98,750
" Ellen	35,000	25,000
" " Prospect House	37,500	37,500
Gladstone, Mrs.	8,250	6,500
Toll gate	2,900	2,500
Macklem	100,000	26,175
Canada Southern	150	100
Vanderbilt	850	450
Brett	250	250
	402,867	290,569

From the above tabulated statement it will be seen that the total amount awarded is $402,867, as against $290,569 offered by the Commissioners, the difference between the two amounts being $103,298. This large difference is chiefly confined to five out of

twenty-three cases brought before the Arbitrators. In these five cases the principal evidence rested on the incomes the proprietors derived from charges made to the public visiting the Falls.

While the Commissioners did not anticipate so large a difference between the amounts offered by them and the amounts awarded by the Arbitrators, they cannot but realize the strength of the evidence on which the awards are founded, as affording proof of the very large number of visitors to the Falls, and which supports the view expressed by them in their former reports of the undertaking becoming self-sustaining.

The amount to be provided to pay for the land according to the award, being in excess of that offered by the Commissioners, compels them to increase the total amount necessary to carry out the Niagara Falls Park project by $25,000, making the total amount required $525,000.

During the past year the Commissioners endeavoured to obtain as reliable information as possible from various sources, of the annual number of visitors to the Falls, and as far as that could be ascertained, the average number for a period of several years may be safely estimated as between 200,000 and 250,000 persons per annum.

Notwithstanding that a little larger amount will be required for the purpose of carrying out the project, the Commissioners adhere to the recommendation made in their report of 16th March, 1886.

That the park shall be absolutely free to all visitors who enter it, to enjoy the natural beauties and such views as it affords without artificial aid, not needing machinery, structures, guides, etc.; but they advise that the maximum charge to visitors, who desire to see all the magnificient and wonderful sights, requiring guides and artificial aid, shall be 50 cents instead of 30 cents.

Based on such charge it will require 82,420 visitors annually, only one-third of the whole estimated number to meet the cost of maintaining the park and to provide for the payment of interest and sinking fund on the bonds. The Commissioners' reports of 18th September, 1885, 7th December, 1885, and 16th March, 1886, have so fully referred to the subject in all its bearings, that they beg to refer you to them for further information.

In conclusion, the Commissioners beg to call your attention to the Act of the Legislature of Ontario, 48 Vict., and entitled "An Act for the preservation of the Natural Scenery about the Niagara Falls," which provides that the payment for the lands taken for the Niagara Falls Park must be made on or before the 28th day of March, 1887, in this Her Gracious Majesty's Jubilee Year.

We have the honour to remain,
Your obedient servants,

C. S. GZOWSKI,
Chairman.
J. H. LANGMUIR,
J. GRANT MACDONALD,
} Commissioners.

Office of The Niagara Falls Park Commission,
Toronto, 5th March, 1887.

(No. 37).

Analysis of Reports of County and Township Agricultural Societies and of Horticultural Societies for the year 1885, in accordance with the provisions of sections 47 and 48, chapter 35, R. S. O. *(Not printed).*

(No. 38).

Regulations respecting Mechanics' Institutes and Art Schools. *(Not printed).*

CORRESPONDENCE

Respecting the Land and Timber in the recently Disputed Territory of the Province of Ontario.

Presented to the Legislative Assembly,

By Command,

ARTHUR S. HARDY,

Provincial Secretary.

Provincial Secretary's Office,

21st March, 1887.

TABLE OF CONTENTS.

[The Secretary of State to the Lieutenant-Governor.]

{ 9400 on 27594 }

Department of the Secretary of State,
Ottawa, 8th November, 1886.

Sir,—Adverting to the letter from this Department of the 22nd July, 1874, transmitting copy of an Order of His Excellency the Governor-General in Council approving of a Memorandum of Agreement adopted by the Honourable the Minister of the Interior and the Honourable the Commissioner of Crown Lands of the Province of Ontario, relative to a provisional arrangement respecting the Western and Northern Boundaries of that Province, I have the honour to acquaint you for the information of your Government that His Excellency the Administrator of the Government is advised as follows :—

1. In accordance with the arrangement above alluded to, licenses to cut timber in the Disputed Territory were issued to Mr. Henry Bulmer, junior, and a number of others, who afterwards made assignments of their rights to the said Henry Bulmer, and that under the authority thus acquired Mr. Bulmer, and those associated with him, erected a sawmill near Rat Portage, of a cutting capacity of one million feet a month (day work), being more than that requisite to comply with the timber regulations in that behalf in respect of all the berths acquired by him by assignment from other licensees and made an expenditure said to be equal to $150,000 in connection with their mills and improvements and in building boats, barges and other works necessary to carry on their lumbering business ;

2. Since the decision rendered by the Judicial Committee of the Imperial Privy Council on the subject of the boundary between Ontario and Manitoba this Government has declined to renew the licenses to Mr. Bulmer and his associates, this refusal, in the nature of things, resulting in serious loss and embarrassment to a large business enterprise, the success of which would be of great advantage to the country ;

3. In view of these circumstances and recognizing the importance of the continuance of the enterprise, His Excellency's advisers would be glad to come to some arrangement with your Government under which Mr. Bulmer and his associates, pending a settlement of the question as to the Indian title in the Territory affected by the decision of the Judicial Committee of the Imperial Privy Council, may be permitted to continue to cut and manufacture timber on the berths acquired by them before the said decision was rendered.

I have the honour to be, Sir,
Your obedient servant,

J. A. CHAPLEAU,
Secretary of State.

His Honour,
The Lieutenant-Governor of Ontario,
Toronto.

[Telegram from the Lieutenant-Governor to the Secretary of State.]

Government House,
Toronto, 22nd January, 1887.

To the Honourable,
The Secretary of State,
Ottawa.

Please send copy of despatch of 8th of November last, number 9400 on 27594, adverting to Memorandum of Agreement between Minister of Interior and Commissioner of Crown Lands, and to an Order in Council respecting sale of lands in disputed territory; as the original despatch has been mislaid.

J. B. ROBINSON,
Lieutenant-Governor of Ontario.

[The Under Secretary of State to the Lieutenant-Governor.]

{431 on 27594 of 1886.}

Department of the Secretary of State,
Ottawa, January 24th, 1887.

Sir,—In compliance with the request contained in your telegram of the 22nd inst., I have the honour to transmit to you herewith copy of the despatch which was addressed to you on the subject of an Order of His Excellency the Governor-General in Council approving of a Memorandum of Agreement adopted by the Honourable the Minister of the Interior and the Honourable the Commissioner of Crown Lands of the Province of Ontario, relative to a provisional agreement respecting the Western and Northern Boundaries of the Province.

I have the honour to be, Sir,
Your obedient servant,

G. POWELL,
Under Secretary of State.

His Honour,
The Lieutenant-Governor of Ontario,
Toronto.

[From the Lieutenant-Governor to the Secretary of State.]

{561 / 1887}

Government House,
1st February, 1887.

Sir,—Adverting to the subject of your despatches of the 8th November, 1886, and 24th January, 1887, I shall be obliged by your communicating to me for the information of my Government the following particulars:—

1st. The dates of the several licenses to Mr. Bulmer, and the others, who have assigned their rights to him;

2nd. A description of the limit embraced in each;

3rd. A copy of the papers and documents (or the originals) in possession of your Government relating to the several limits. This information is needed for the purpose of considering any such arrangement as you suggest, pending the further litigation as to the Indian Title.

I regret very much the delay which has been occasioned by your despatch of November having been mislaid.

I have the honour to be, Sir,
Your obedient servant,

J. B. ROBINSON,
Lieutenant-Governor of Ontario.

The Honourable,
THE SECRETARY OF STATE,
Ottawa, Ont.

[FROM THE LIEUTENANT-GOVERNOR TO THE SECRETARY OF STATE.]

$\left\{\frac{557}{1887}\right\}$

GOVERNMENT HOUSE,
TORONTO, 9th February, 1887.

SIR,—My Government have had their attention called to a letter in the Algoma newspapers addressed by Mr. Burgess, as Deputy Minister of the Interior, to S. J. Dawson, M.P., setting forth that a communication had been lately sent to me stating that the Government of Canada would be glad to come to some arrangement with the Government of this Province with respect to licenses to cut timber in the recently disputed territory, "pending a settlement of the question as to the land titles in the territory."

I have to state that, so far as I recollect or am aware, no such communication has been received by me unless the reference is to your despatch of the 8th November, which mentions the case of Mr. Bulmer and his company, and no others.

In case any such proposal is contemplated though not yet made, my Government hope that they may at the same time receive a list of all the licenses, which, since the making of the Boundary Award, have been granted in respect of the territory now finally decided to be within this Province; with the dates of the licenses, and the limits embraced in each; also copies of all Orders in Council and correspondence with reference to such licenses and limits. According to the judgment of my Government, it would be impossible to consider intelligently any such contemplated proposal as Mr. Burgess suggests, without information as to all matters which may be affected by any arrangement.

I observe that Mr. Burgess' letter to Mr. Dawson states that "if the Ontario Government agrees to an arrangement with respect to the licenses, they will be asked to agree to an arrangement of a somewhat similar nature in regard to title to lands in fee simple." My Government are of opinion that the latter subject may be more easily dealt with than the former; and they shall be glad to consider without delay any proposal which your Government may make upon the subject, whether any arrangement as to licenses to cut timber may or may not be proposed by your Government. My Government desire to remind you that whatever has been done by your Government since the making of the Award in granting licenses or otherwise dealing with the lands in the territory referred to, has been done against the protests of the Provincial Government, and that though information has been repeatedly asked for, the Government of this Province have not yet had communicated to them the particulars above mentioned. My Government would be glad to receive the information now, and to consider with promptitude any interim arrangement which your Government may suggest.

I have the honour to be, Sir,
Your obedient servant,

JOHN BEVERLEY ROBINSON,
Lieutenant-Governor of Ontario.

The Honourable,
THE SECRETARY OF STATE,
Ottawa, Ont.

[The Under Secretary of State to the Lieutenant-Governor.]

{758 on 1386}

Department of the Secretary of State,
Ottawa, 11th February, 1887.

Sir,—I have the honour to acknowledge the receipt of your despatch of the 19th instant, having reference to a letter in the Algoma newspapers, addressed by Mr. Burgess, as Deputy Minister of the Interior, to Mr. S. J. Dawson, M.P., setting forth that a communication had been lately sent to you, stating that the Government of Canada would be glad to come to some arrangement with the Government of Ontario, with respect to licenses to cut timber in the recently disputed territory, "pending a settlement of the question as to the land titles in the territory," and to state that the matter will receive consideration.

I have the honour to be, Sir,
Your obedient servant,

G. POWELL,
Under Secretary of State.

His Honour,
The Lieutenant Governor of Ontario,
Toronto, Ont.

(No 40).

Copies of all regulations made by the Lieutenant-Governor in Council, under the Act to amend the Free Grants and Homesteads Act, 43 Vic., cap. 4. (*Not printed*).

(No. 41).

Return from the Queen's Printer as to the disposal of the Revised Statutes of Ontario for the year 1886. (*Not printed*).

(No. 42).

Return from the Queen's Printer as to the disposal of the Statutes of Ontario for the year 1886. (*Not printed*).

(No. 43).

Return shewing what application has been made for payments out of the Consolidated Revenue, under the provisions of sec. 4, cap. 4, 43 Vic., in respect of the dues on pine trees. Also, shewing what is the aggregate sum which, up to the first day of March last, the patentees of lands subject to the provisions of the Act, are entitled to receive out of the dues collected on pine trees cut after date of their Patents. (*Not printed*).

RETURN

To an Order of the House, dated the 10th March, 1887, for copies of all correspondence with the Architect, Mr. Waite, concerning the plans prepared by him for the proposed new Parliament and Departmental Buildings, and any agreement made with him concerning his remuneration as such Architect.

Presented by command,

A. S. HARDY,
Secretary.

PROVINCIAL SECRETARY'S OFFICE,
TORONTO, March 24th, 1887.

(Mr. Creighton.)

COPIES OF ALL CORRESPONDENCE WITH THE ARCHITECT, MR. R. A. WAITE, CONCERNING THE PLANS PREPARED BY HIM FOR THE PROPOSED NEW PARLIAMENT AND DEPARTMENTAL BUILDINGS, AND THE AGREEMENT MADE WITH HIM CONCERNING HIS REMUNERATION AS SUCH ARCHITECT.

DEPARTMENT OF PUBLIC WORKS.
TORONTO, January 8th, 1886.

R. A. WAITE, ESQ.,
German Insurance Building, Buffalo, N. Y.

SIR,—Having reference to the consultation had with you this morning with respect to your being engaged to prepare plans, etc., for the new Provincial Parliament and Departmental Buildings to be erected in this city, I herewith state briefly the terms and conditions upon which the Government will be willing to engage your services as Architect in the preparing of these plans, etc., and for the usual Architect's control and supervision of the work until fully completed.

1. The total costs of the buildings when fully completed is not to exceed the amount of $750,000, set apart therefor by the Provincial Legislature, and within the limit of that expenditure ample provision and accommodation must be secured for the several departments, and their offices and vaults, the Provincial Library, the Legislative chamber, Committee rooms, Speaker's and house-officers' apartments, etc., as fully, in all respects, as is set forth and required by the printed general instructions issued by the Department of Public Works, in April, 1880, for the guidance of Architects, then being asked to submit competitive designs for said buildings; and you will consider these general instructions as a guide in the preparation of plans, etc., by yourself.

2. The remuneration for your services (including all necessary and usual superintendence, etc., during the course of construction) to be at the usual rate of five per cent. calculated upon the total contract cost; such total contract cost not to include any sum or sums to which contractors may become entitle for any work commonly known as extras.

3. No extra work of any kind or character to be sanctioned or directed in connection with the construction of the buildings except, and to the extent only, that the same has been first authorized in writing by the Commissioner of Public Works for the time being.

4. The Government to have the absolute and unrestricted right to reject any plans, etc., prepared or submitted.

(1) If, in the opinion of the Commissioner of Public Works, the same are either defective, faulty or unsuitable.

(2) If, in the opinion of the Commissioner, satisfactory contracts for the completion of the building within the contemplated total costs are not, or cannot be secured, or entered into.

(3) And in any such case you are to have and be entitled to only such remuneration in respect of all services rendered, work done, loss of time, etc., whether in respect of plans and specifications and their preparation or otherwise, howsoever, as in the discretion of the Commissioner of Public Works may be fixed and allowed by him.

5. The plans (so far as necessary for submission to the Local Legislature) to be ready and delivered to the Department of Public Works not later than the fifteenth day of March next.

6. Plans and specifications to be sufficiently completed to admit of tenders for the works being advertised for not later than the first day of May next.

You will, at your very earliest convenience, please to notify the Department whether or not you will undertake the preparations of plans, etc., upon and subject to the terms and conditions above mentioned.

I remain, yours, etc.,

(Signed), C. F. FRASER,
Commissioner, etc.

Department of Public Works, Ontario.
Toronto, January 19th 1886.

Sir,—I am directed by the Honourable the Commissioner to request you to favour him with a reply to his letter to you of the 8th instant, respecting the preparation of plans, etc., for the proposed new Parliament Buildings for the Province, to be erected in this City.

Your obedient servant,
(Sigd) WM. EDWARDS,
Secretary.

Richard A. Waite, Esq.,
Architect, etc.,
German Insurance Buildings Buffalo, N. Y., U.S.

Buffalo, N.Y., January 20th 1886.

Honourable Sir :—I am in receipt of your favour of the 8th inst., embodying the terms and conditions upon which your Government offers to engage my services as Architect for the new Provincial Parliament and Departmental Buildings to be erected in Toronto.

I have carefully noted the conditions and requirements named, and herewith accept them.

Respectfully yours,
(Sgd) RICHARD A. WAITE.

To the Hon. C. F. Fraser,
Commissioner of Public Works,
Province of Ontario, Toronto Ont.

Department of Public Works, Ontario.
Toronto, January 21st 1886.

Sir :—I am instructed to acknowledge the receipt of your favour of the 20th instant, in reply to the Commissioner's letter of the 8th instant, and to say that, pursuant to your letter of acceptance, you are to consider yourself authorised to forthwith proceed with the preparation of plans, etc., subject to the terms set forth in the Commissioner's letter above referred to.

The Commissioner further desires me to say that, as prompt and speedy prosecution of the works in connection with the proposed new buildings is in the last degree urgent and important, he confidently trusts that your preparation of the plans, etc., will be pushed forward with all possible despatch ; and so as to secure *without fail* the commencement of operations in the early part of the approaching building season.

I am, Sir,
Your obedient servant

(Sig) WM. EDWARDS.
Secretary.

R. A. Waite, Esq., Architect, etc.,
German Insurance Building, Buffalo, N. Y., U.S.

Buffalo, N.Y., January 25th 1886.

Hon. Sir,—Every effort is being made to enable my presenting plans at as early day as possible : Each hour since the receipt of personal instructions has been occupied in solving the complexity of arrangements.

The writer expects to call on you this week, with sketch plans, to consult about minor office detail, and relation of one department with the other.

Respectfully yours,
(Signed) RICHARD A. WAITE.

To Hon. C. F. Fraser,
Commissioner of Public Works,
Ontario, Toronto.

Buffalo, N. Y., February 11th, 1886.

Hon. Sir,—Will call on you Tuesday morning with sketch plans of the different floors, to consult you as to minor office detail.

Respectfully yours.
(Signed) RICHARD A. WAITE.

To Hon. C. F. Fraser,
Commissioner Public Works,
Toronto.

Department of Public Works, Ontario,
Toronto, 18th March, 1886.

My Dear Waite,—It is of the utmost importance that I should have here, at the very latest, by Monday evening next, all further plans, perspective and otherwise, which you have so far prepared, *even though they may be in a somewhat unfinished state.* It is expected that the Legislature will adjourn during the course of next week, and I must, so far as it is possible, be able to give them information as to the proposed new plans ; and, if called for, place the same before them. Please see to this without fail. I will be glad to have a telegram from you to-morrow in reply.

Faithfully yours,
(Signed) C. F. FRASER.

R. A. Waite, Esq.,
Architect, Etc., German Insurance Buildings, Buffalo, U. S.

Buffalo, N. Y., March 20th, 1886.

Honourable Sir,—Yours of the 18th inst. requesting me to forward you at once further plans and sketch elevations, finished or unfinished, of the proposed Parliament Buildings, at hand. Have wired you that I could not deliver any more drawings by the time named.

The writer fully realizes the necessity of your having elevations, especially in perspective drawing, to lay before the Honourable body if asked for, but the time since the receipt of your instructions has been too short for a faithful interpretation of the programme imposed, and also the designing of a building requiring distinctive character.

It may be of assistance to briefly point out a few features in the plans submitted. The building is divided into well defined blocks, these being arranged on the site in the best manner to obtain light and artistic grouping externally. The great hall occupying a central position in the front, a distinctive and integral part of the design prominently pronounced externally ; its axis arranged at right angles, or parallel to the blocks of offices, and united to them, not in a parsimonious, niggardly manner, but with an obvious desire to produce an impressive effect upon the visitor, and to make a good approach without apparent effort. There is no long struggling corridors bent or twisted to connect two parts or offices.

Every part fits its connecting part well and easily ; the entrances to halls are made inviting and spacious, without being wasteful. Its immediate surroundings are visible (staircase and elevators) well considered and amply lighted. The grouping of rooms are arranged at right angles practically proportioned, well lighted, and so disposed as to produce a pleasing *ensemble.*

I assure you that every effort is being made to have the necessary working plans complete, to enable your receiving proposals for work by the middle of next May.

Most respectfully yours,

(Signed) RICHARD A. WAITE.

To the Hon. C. F. Fraser,
Commissioner of Public Works,
Toronto, Ontario.

Department of Public Works, Ontario.
Toronto, 13th April, 1886.

My Dear Waite,—I expect to be here the whole of the present and the greater part of next week. I am exceedingly anxious that the plans, etc., of the new buildings should be in such shape that by the close of the month we could be advertising for tenders ; before the specifications are prepared and finally settled it is necessary that I should see you as to one or two points. Can you come over this or next week, and bring with you the plans.

Faithfully yours,

(Sgd.) C. F. FRASER.

R. A. Waite, Esq.,
German Insurance Buildings, Buffalo, N. Y.

Department of Public Works, Ontario.

Toronto, 14th April, 1886.

My Dear Waite,—When I wrote you yesterday I was under the impression that I might be here during the whole of next week. I find now that I may not probably

remain longer than this day (Wednesday) week. Please, therefore, to answer, so that I will be certain to see you here with plans, etc., before leaving. And further oblige by telegraphing in good season as to the date of your coming.

Faithfully yours,

(Sgd.) C. F. FRASER.

R. A. WAITE, Esq.,
German Insurance Building, Buffalo, N. Y.

BUFFALO, N. Y., April 15th, 1886.

DEAR SIR,—I will call upon you either Monday of Tuesday, a.m., of next week; the usual hour.

Most respectfully,

(Signed), RICHARD A. WAITE.

To the HON. C. F. FRASER,
Commissioner of Public Works,
Toronto, Ont.

DEPARTMENT OF PUBLIC WORKS, ONTARIO,
TORONTO, 13th May, 1886.

MY DEAR WAITE,—Will you kindly telegraph me without fail to-morrow (Friday) the probable day on which I may be expecting you here with completed plans, etc. I wish to know so as to make certain of my being on hand.

I need not repeat to you how anxious I am to be in a position to advertise for tenders for the erection of the new buildings.

Faithfully yours,

(Sgd.) C. F. FRASER.

R. A. WAITE, Esq.,
German Insurance Buildings, Buffalo.

BUFFALO, N. Y., May 15th, 1886.

HON. SIR,—Yours of May first at hand, and as requested send telegram. The full drawings are not as yet complete, having found it necessary to destroy first set of elevations after computation of cost. Engaged upon a set of elevations less expensive in detail and hope to present same in about a fortnight.

I fully appreciate your anxiety and every effort is being made to save time. Will have two complete sets of working drawings for masonry works, thus saving time with bidders.

Most respectfully yours,

(Signed) RICHD. A. WAITE.

DEPARTMENT OF PUBLIC WORKS, ONTARIO,
TORONTO, 1st June, 1886.

MY DEAR WAITE,—I am confidently expecting that you will be here this week with plans and specifications in shape to permit of tenders for the new buildings being at once advertised for.

I cannot too strongly urge the necessity that exists for operations in respect of these buildings being speedily commenced, and I am relying upon your having plans, etc., ready for our consideration within the week.

Please to let me know by telegram what day you will be here.

Yours, etc.,

(Sgd.) C. F. FRASER.

R. A. WAITE, Esq.,
German Insurance Buildings, Buffalo.

TELEGRAM FROM BUFFALO, N. Y.

JUNE 4th, 1886.

Mr. Waite absent from home. Expects visit Toronto on return.

(Signed) WM. T. WAITE.

To C. F. FRASER.

TELEGRAM FROM BUFFALO, N. Y.

7th JUNE, 1886.

To C. F. FRASER.

My brother's sickness compels his deferring visit.

(Signed) WM. T. WAITE.

BROCKVILLE, 8TH JUNE, 1886.

MY DEAR WAITE,—The delay in your finishing of plans, etc., is becoming awkward and embarrassing, because of the pledges we have given that the work would by this time be under way.

I must, therefore, request that, without fail, your plans shall be completed and ready for submission to the Government by Wednesday of next week.

I will return to Toronto so as to be there as early as Tuesday next.

Faithfully yours,

(Signed) C. F. FRASER.

R. A. WAITE, ESQ.,
German Insurance Building, Buffalo.

BUFFALO, N. Y., JUNE 12TH, 1886.

DEAR SIR,—Answer to yours of the 8th inst. delayed owing to my being absent in Toronto. While there I called to see you ; being absent, my business was made known to your Mr. Edwards, who kindly gave me sketches submitted some months ago.

The working drawings are not complete enough to submit to you Wednesday next, as stated in previous letter ; I found it necessaay to make a second set of studies, which are now complete. In computing the cost, I find several are correct, hence it is now a matter of clerical work and attention to a hundred little details.

Your being pressed is fully realized by the writer, who is endeavouring to relieve you from anxiety, at the same time sensitive to fill with scrupulous exactness, all the conditions imposed by necessity, which means study, time and labour to elaborate.

Most respectfully yours,

RICH'D. A. WAITE.

To the Hon. C. F. Fraser,
Brockville, Ont.

Office of Richard A. Waite, Architect,
German Insurance Building, Buffalo, N. Y.,
June 14th, 1886.

My Dear Sir,—I very much regret that yours of the 12th appointing either Tuesday or Wednesday of this week to call upon me is too late to admit of my rearranging engagement that necessitates my leaving here to-morrow afternoon, returning the following evening.

Please defer your visit until Thursday or Friday of this week.

Hastily yours,

(Signed) RICH'D. A. WAITE.

Copy of Telegram.

Toronto, 15th June, 1886.

To Richard A. Waite,
German Insurance Building, Buffalo.

Will go to Buffalo to-morrow, and expect to see you early Thursday forenoon, so as to return here same day.

(Signed) C. F. FRASER.

Telegram.

Buffalo, July 10th, 1886.

To Hon. C. F. Fraser,
Brockville.

Delays in office work prevent my fulfilling engagement for next week. See letter.

(Signed) R. A. WAITE.

Department of Public Works, Ontario,
Toronto, 13th July, 1886.

My Dear Waite,—I am greatly disappointed to learn from your telegram that detail plans are not yet completed, and that the asking for tenders for the new buildings must be still further delayed. I have broken up my holiday trip and have returned here purposely to make the necessary final arrangements for calling for tenders. The personal disappointment to myself is not of consequence, but it is important and urgently important

that the buildings should be speedily under way. I must ask you, therefore, to have the necessary detail plans, etc., ready within the present week, and I will expect your answer to-morrow, naming the day when you can be here with them. Please to give me a reply to this to-morrow by telegram. Your telegraphic message speaks of a letter, but I have not received any.

Yours, etc.,
(Sgd.) C. F. FRASER.

R. A. Waite, Esq.,
German Insurance Building, Buffalo.

Department of Public Works, Ontario,
Toronto, July 24th, 1886.

Sir,—The Hon. the Commissioner writes me from Brockville that he will hold himself in readiness to meet you here next week, according to promise; and directs me to ascertain as soon as possible the day on which, "for certain," you will be here, so that I may be able to give him sufficient notice.

Will you, therefore, have the goodness to advise me at the earliest possible moment of the day and hour you may propose to be here with plans, etc., etc.

Your obedient servant,
(Sgd.) WM. EDWARDS,
Secretary.

R. W. Waite, Esq., Architect, etc.,
German Insurance Building, Buffalo, N.Y.

Department of Public Works, Ontario,
Toronto, October 20th, 1886.

Dear Sir,—The Hon. the Commissioner directs me to say that he would like to see you here some day this week, or the early days of next week; and that he requests you to notify me of the day, so that he may make a point of being here to meet you.

Yours respectfully,
(Sigd.) Wm. EDWARDS,
Secretary.

R. A. Waite, Esq., Architect, etc.,
Buffalo, N.Y.

Buffalo, N.Y., October 21st, 1886.

Dear Sir,—Please inform the Hon. Commissioner that I will arrange to be in Toronto next Wednesday. calling upon him at ten a.m.

Yours truly,
(Signed) RICH'D. A. WAITE,

To Wm. Edwards, Esq.,
Toronto, Ont.

STATEMENT

Of the Returns forwarded to the Office of the Provincial Secretary, of all the Fees and Emoluments received by the Registrars of Ontario for the year 1886, made in accordance with the provisions of the Revised Statutes of Ontario, Chapter 111, Section 97, and 43 Vic. Chapter 3, Section 2, with which are contrasted Receipts of same nature in 1884 and 1885.

By Command,

A. S. HARDY,
Secretary.

Provincial Secretary's Office,
Toronto, March 22nd, 1887.

STATEMENT of the Returns forwarded to the Office of the Provincial Secretary of all the accordance with the provisions of the Revised Statutes of Ontario, chap. 111, sec. 97, and

OFFICE.	REGISTRAR.	Number of Municipalities in the District.	Number of Instruments registered during the year 85.	Number of Instruments registered during the year 86.	Amount of Fees received sections 1, 12, Total Registrations under sub-sections 1, 6, 11, 12.		For searches, sub-sections 2, 3, 10.		For Abstracts, sub-section 4.	
					$	c.	$	c.	$	c.
Algoma	Chas. J. Bampton	89	.....	.....	760	75	67	90	126	50
Brant	Thomas S. Shenston	7	2229	2441	3367	85	381	95	398	85
Bruce	Donald Sinclair	27	3782	3610	5511	75	262	60	1262	25
Carleton	John Waller (Acting Registrar)	12	2036	2267	3143	85	376	70	683	75
Dufferin	William McKim	8	1629	1691	2423	00	170	25	574	50
Dundas	Simon S. Cook	6	1045	1213	1519	25	77	15	128	05
Durham, E. R.	George C. Ward	5	761	782	1149	40	195	25	170	30
Durham, W. R.	Robt. Armour	5	709	833	1224	73	113	45	252	40
Elgin	Archibald McLauchlin	12	.....	3584	4640	90	399	55	506	20
Essex	James W. Askin	19	3690	3889	5406	52	685	90	1250	60
Frontenac	R. M. Rose	18	1265	1325	1866	25	263	94	152	47
Glengarry	Angus McDonald	5	1064	1388	1653	80	130	30	182	56
Grenville	Patrick McCrea	9	1069	1327	1839	05	136	65	287	80
Grey, N. R.	Robert McKnight	11	2748	2773	3986	15	208	20	1035	15
Grey, S. R.	Thomas Lauder	8	1803	1959	2667	45	68	36	468	50
Haldimand	Agnew P. Farrell	13	1509	1767	2283	35	257	70	520	57
Haliburton	Frederick Mooney	9	195	207	277	30	18	90	86	20
Halton	Francis Barclay	9	1295	1300	1772	65	377	40	232	55
Hastings	Wm. H. Ponton	28	3272	3462	4831	75	385	90	1219	85
Huron	James Dickson	24	4220	4213	5369	90	371	90	1270	25
Kingston City	James P. Gildersleeve	1	574	696	951	00	202	20	77	20
Kent	Peter D. McKellar	17	4669	4664	6098	25	646	85	1297	35
Lambton	Edward Moore Proctor	20	4618	4727	6391	40	1041	15	751	12
Lanark, N. R	John Menzies	8	665	830	1208	80	80	40	139	55
Lanark, S. R.	James Bell	10	1014	1345	1773	90	200	30	112	30
Leeds	Wilmot H. Cole	13	1905	2212	3101	60	341	65	424	68
Lennox and Addington	Robt. Mills, Deputy Registrar	12	1512	1509	2043	75	100	60	278	55
Lincoln	James George Currie	14	1674	1671	2380	15	257	89	707	40
London City	William C. L. Gill	1	1053	1385	1879	35	274	10	238	80
Middlesex, E. & N. R.	John Walker	14	3124	3023	4103	45	841	85	399	70
Middlesex, W. R.	Stephen Blackburn	9	1401	1440	1914	75	235	65	465	15
Muskoka District	John E. Lount	25	1162	1066	1482	95	177	50	252	70
Nipissing District	John Doran, per A. Irving, Deputy	.....	.....	122	182	50	12	60	17	35
Norfolk	Augustine J. Donley	10	2069	2198	3084	40	405	15	405	95
Northumberland, E. R.	John M. Grover	9	1464	1410	2159	62	188	15	913	77
Northumberland, W. R.	Wm. H. Eyre	5	795	749	1026	40	97	39	284	15
Ontario	John Ham Perry	17	2703	2628	3468	90	226	45	401	85
Ottawa City	Alexander Burritt	1	1353	1616	2355	45	534	20	324	05
Oxford	George R. Pattullo	16	3118	3479	4910	20	501	15	1287	75
Parry Sound District	A. Starkey	44	539	956	1346	20	97	45	332	30
Peel	Alex. Dick	8	1436	1604	2235	10	244	70	353	65
Perth, N. R.	David D. Hay	9	1838	1961	2585	60	227	50	624	15
Perth, S. R	Patrick Whelihan	7	992	1084	1451	25	133	50	411	60
Peterborough	Bernard Morrow	19	1952	1928	2581	60	338	10	568	80
Prescott	John Higginson	11	1424	1474	1988	80	88	49	183	25
Prince Edward	Walter McKenzie	9	1316	1534	2059	88	209	45	415	15
Rainy River District	Frank J. Ap'John	1	.....	166	227	96	2	75	33	24
Renfrew	Andrew Irving	25	1737	1937	2702	60	377	40	204	60
Russell	James Keays	4	1038	1057	1520	65	23	50	353	60
Simcoe	Samuel Lount	25	5148	5385	6848	78	643	85	700	00
Stormont	John Copeland	5	1115	1447	1830	75	190	25	252	60
Thunder Bay District	Wm. H. Laird	23	766	509	736	85	195	15	500	10
Toronto City	Charles Lindsey	1	9847	14243	21070	75	2749	65	1748	35
Victoria	Hartley Dunsford	14	1727	1849	2497	75	245	30	634	67
Waterloo	Dougald McDougall	12	2462	2990	3809	15	176	60	267	35
Welland	Dexter D'Everardo	15	1893	2124	2992	50	593	18	778	45
Wellington, N. R.	John Anderson	11	1577	1886	2426	30	144	30	958	80
Wellington, S. & C. R.	Nathaniel Higinbotham	11	1870	1997	2605	00	286	55	485	10
Wentworth	J. M. Williams	10	3991	4816	6503	75	695	55	1571	20
York, E. & W. R.	John Ridout	11	3722	5230	7559	75	1264	75	729	10
York, N. R.	James J. Pearson	9	.....	1535	2241	05	169	25	321	45

*Not including amount paid to County nor cost of

Fees and Emoluments received by the Registrars of Ontario for the year 1886, made in 43 Vic., ch. 3, sec. 2, with which are contrasted Receipts of same nature in 1884 and 1885.

under the Tariff as allowed by sub-of section 92 of the Act.				Gross amount of Fees proper for 1884.	Gross amount of Fees proper for 1885.	Gross amount of Fees proper for 1886.	Aggregate amount of Fees and Emoluments earned by Registrar during the year 1886, by virtue of his office.	Amount of Fees actually received for 1886.	Amount of Disbursements in connection with office for 1886.
For Certificates, sub-section 5.	For Affidavits and Oaths, sub-section 9.	Special Receipts. For Abstracts, Indices, sub-sec 8.	Special Receipts. For work connected with transfer of Instruments paid by Co. Treas. s. s. 7						
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
33 15	.....	.....	800 00	794 63	773 25	988 30	1788 30	1788 30	329 43
46 20	.....	.....	.....	3598 45	3834 30	4194 85	4194 85	4194 85	1287 94
.....	.....	.....	.....	6240 45	6483 42	7036 60	7036 60	7075 96	3522 70
100 80	14 50	.....	.....	.....	3674 50	4319 60	4319 60	4319 60	* 100 00
20 25	.....	.....	.....	2911 50	3172 70	3188 00	3188 00	2997 00	1077 92
3 25	3 25	.....	.....	1408 35	1497 10	1730 95	1730 95	1730 95	637 55
.....	.....	.....	.....	1765 95	1446 05	1514 95	1514 95	1500 50	615 75
.....	.....	.....	.....	1553 70	1257 90	1590 58	1590 58	1590 58	.....
.....	.....	.....	.....	6156 12	6016 15	5546 65	5546 65	5434 27	2920 76
378 24	9 50	.....	.....	7157 19	7268 64	7730 76	2944 84	7730 76	4785 92
.....	.....	.....	.....	2514 60	2235 46	2282 66	2282 66	1464 78	604 88
3 75	3 75	.....	.....	1353 90	1696 67	1974 16	1974 16	1184 50	789 66
4 75	6 25	.....	.....	1843 45	1854 80	2274 50	2274 50	2264 75	925 00
48 50	.....	.....	.....	4751 85	5232 10	2875 75	5278 00	5278 00	2402 25
28 25	54 80	2 00	.....	3062 77	3016 94	3289 36	3289 36	2969 36	886 47
4 00	3 00	.....	.....	2484 57	2783 56	3068 62	3068 62	3009 68	1270 10
4 00	50	.....	.....	439 40	330 20	386 90	386 90	386 90	.....
10 75	25	.....	.....	2299 45	2366 05	2393 60	2393 60	2393 60	787 45
46 20	50	.....	.....	5840 90	5811 45	6484 20	6484 20	5415 65	2100 00
94 12	.....	.....	.....	7269 25	6784 42	7106 17	7106 17	6886 17	2140 00
.....	.....	.....	.....	1048 98	969 82	1230 40	1230 40	1214 05	608 45
94 75	.....	.....	.....	9001 20	8602 40	8137 20	8137 20	8137 20	2572 94
.....	.....	.....	.....	8641 15	8055 70	8183 67	8183 67	8183 67	†2690 30
28 75	.....	.....	.....	1198 50	1275 20	1457 50	1457 50	1457 50	630 00
5 35	1 00	.....	.....	1900 70	1619 75	2092 85	2092 85	2075 05	476 00
9 00	2 50	1000 00	.....	4018 76	3466 64	4884 03	4884 03	4596 55	1625 20
3 75	.....	.....	.....	2383 37	2418 85	2426 65	2426 65	2207 08	2207 08
.....	.....	.....	.....	3264 70	3331 05	3345 44	3345 44	3345 44	766 25
.....	.....	.....	625 79	1909 65	1929 35	2392 25	3018 04	3018 04	757 36
108 60	75	.....	.....	5543 85	5211 65	5454 35	5454 35	5454 35	1336 95
121 20	50	.....	.....	2892 80	2940 20	2737 25	2737 25	2737 25	543 72
20 05	12 75	.....	.....	1649 80	2050 40	1945 95	1945 95	1579 78	325 00
1 00	.....	.....	.....	122 15	270 32	213 45	213 45	213 45	.....
112 75	4 00	.....	.....	1319 65	3810 75	4012 25	4012 25	3889 88	1475 00
19 00	.....	.....	.....	3078 36	3101 40	3280 54	3280 54	3001 48	1009 50
.....	1 00	.....	.....	1795 50	1595 65	1408 94	1408 94	1184 54	450 00
36 75	.....	.....	.....	4001 30	4256 75	4133 95	4133 95	4108 30	1681 80
76 60	.....	.....	.....	2665 55	2809 35	.....	3290 30	3290 30	881 69
59 65	1 50	.....	.....	5403 35	5466 60	6759 25	6759 25	5653 38	2253 93
10 50	7 50	.....	.....	1025 64	1168 30	1793 95	1793 95	1489 21	689 05
67 65	.....	.....	.....	2286 55	2346 93	2901 10	2901 10	2576 37	710 01
36 35	.....	.....	.....	3599 00	3395 86	3473 60	3473 60	3323 60	1500 00
94 40	.....	.....	.....	2018 10	1907 10	.....	2090 75	1665 30	605 00
5 00	.....	.....	.....	3717 55	3547 90	3493 50	3493 50	3493 50	1315 37
74 90	.....	.....	.....	2056 90	2145 95	2335 44	2335 44	2335 44	450 00
10 50	5 25	.....	.....	2193 76	2231 20	2700 23	2700 23	2700 23	800 00
75	3 00	.....	.....	.....	.....	267 70	267 70	267 70	.....
22 80	2 25	.....	.....	2995 80	3028 85	3309 65	3197 20	3309 65	.....
18 00	34 25	.....	.....	1555 00	1843 33	1958 00	1958 00	1958 00	250 00
.....	.....	.....	.....	7794 15	8110 03	8190 63	8190 63	8190 63	3000 00
2 25	4 75	.....	.....	1793 35	1791 75	2280 60	2284 60	1894 59	350 00
.....	.....	.....	.....	2171 30	1667 00	1432 10	1432 10	1165 38	610 63
109 60	.....	.....	.....	14831 70	18277 50	25678 35	25678 35	25678 35	18027 34
.....	.....	.....	.....	3452 35	3024 46	3377 72	3377 72	3187 67	929 41
16 85	3 00	.....	.....	3602 50	3439 10	4272 95	4514 15	4272 95	1200 00
4 95	4 00	.....	.....	3566 27	4193 75	4373 00	4373 00	3970 10	1535 96
39 40	.....	.....	.....	3369 75	3117 50	3568 80	3568 80	2950 00	750 00
94 95	.....	.....	.....	3468 15	3354 35	3471 60	3471 60	3471 60	1013 81
34 00	4 00	.....	.....	7821 40	7559 05	8808 50	8808 50	7985 15	4978 25
59 00	.....	.....	.....	7102 90	6883 05	9612 60	9612 60	9618 55	6198 67
.....	.....	.....	.....	2271 85	2316 15	2731 75	2731 75	2700 00	500 00

books for office. †Paid County Treasurer, $2341.83.

(No. 46).

Statement in detail of receipts and expenditures on account of the Mercer Estate for the year 1885. (*Not printed*).

(No. 47).

Statement in detail of receipts and expenditures on account of the Mercer Estate for the year 1886. (*Not printed*).

RETURN

To an Order of the House, dated 16th March, 1887, for copies of all correspondence, papers and reports between the Department of Education and William S. Summerby and O. Dufort, Inspectors of Public Schools, in the united Counties of Prescott and Russell, during the last year, on the subject of Public Schools in the French settlements of these Counties. Also, copies of all reports respecting the alleged difficulties between the English and French ratepayers of the Town of L'Orignal, or upon the propriety of establishing a Separate School for Protestant children in that town.

Presented by Command,

A. S. HARDY,

Secretary.

Provincial Secretary's Office,
Toronto, 24th March, 1887.

(*Mr. Evanturel.*)

RETURN.

PAPERS RELATING TO TEACHERS AND TEXT BOOKS IN FRENCH SCHOOLS IN PRESCOTT AND RUSSELL.

EXTRACTS from the Minutes of the Council of Public Instruction, held 20th April, 1868, (for Ontario).

The Committee on Text Books presented the following report, which was adopted:—

The Committee on Text Books beg leave to recommend Klotz's German Grammar for authorization in German schools. They would also suggest that the books marked in the list of books approved by the whole Committee of the Council of Public Instruction for Quebec, shall be sanctioned for the use of the French pupils in those schools in this Province in which there are both Protestant and Roman Catholic French pupils.

The following are the books mentioned:—

Cours d' Arithmetique Commerciale (Senecal, Montreal).
Abiège de la Geographie moderne (Societe d' Education de Quebec).
La Geographie moderne de M. Holmes, M.A.
Grammaire pratique de la langue Anglaise (Par P. Saddler, Paris.
Traite de calenl mental (Par F. E. Juneau).
Traite Elementaire d' Arithmetique (Par F. X. Toussaint).
Le premier livre de l' enfance (de Poitevin).
Cours de Versions Anglaises (Par P. Saddler, Paris).
Grammaire Francaise Elementaire (Par F. P. B.)

HAWKESBURY MILLS,
14th December, 1878.

DEAR SIR,—Will you please send me a catalogue of books authorized for French public schools, Ontario.

Yours truly,
WM. EARL HAYES.

J. G. HODGINS, Esq., Toronto.

EDUCATION DEPARTMENT,
TORONTO, 18th December, 1878.

SIR,—I have the honour to state, in reply to your letter of the 14th instant, that, as reported by the Depository Cashier, no catalogues of authorized French books have been issued.

The Department keeps on hand an assortment of French books suitable for prizes in French schools, and a selection can be made at any time by officers of the Department, and sent subject to the approval of the trustees.

A form of application is sent herewith.

List of authorized text books are also forwarded.

I have, etc.,
J. GEO. HODGINS,
Deputy Minister of Education.

Mr. W. E. HAYES,
S. S. Hawkesbury, Hawkesbury Mills.

HAWKESBURY MILLS,
20th December, 1878.

DEAR SIR,—I have received list of authorized text books and reference books, but it does not contain list of primary books in French which take the place of English reading books. My reasons for asking for this list is, we have a French Roman Catholic Public School in this village, and it has been represented to me, as one of the trustees, that books not authorized by the Department are used in it, in fact that Separate School books are used. So before I can act in the matter I require authorized list.

Yours truly,
WM. EARL HAYES.

EDUCATION DEPARTMENT,
TORONTO, 26th December, 1878.

SIR,—As requested by the Deputy Minister of Education, I have the honour to state, that, the practice of the Department is to allow the use of those French books which have been sanctioned by both the Protestant and Roman Catholic sections of the Council of Public Instruction of Quebec, to be used in Public Schools of this Province also, where there are both Protestant and Roman Catholic French pupils. I have written to the Quebec Department of Education for a recent list.

I have, etc.,
ALEX. MARLING,
Secretary.

Mr. WM. E. HAYES,
S. S. Hawkesbury, Hawkesbury Mills.

EDUCATION DEPARTMENT,
TORONTO, 26th December, 1878.

SIR,—As requested by the Deputy Minister of Education, I have the honour to state, that a list of the French books for elementary schools which have been sanctioned by both the Protestant and Roman Catholic sections of the Council of Public Instruction for Quebec is desired by this Department. The object is to furnish the list to French Public Schools in this Province. Can you oblige us with such a list?

I have, etc.,
ALEX. MARLING,
Secretary.

Dr. MILES,
Education Department, Quebec.

DEPARTMENT OF PUBLIC INSTRUCTION,
QUEBEC, January 7th, 1879.

A. MARLING, Esq.,
Secretary, Education Department, Toronto.

SIR,—In answer to your letter of the 26th ultimo, I have the honour to transmit the list of French elementary text books which have been sanctioned for the use of the public schools in this Province, by the Quebec Council of Public Instruction and its committees.

I have, etc.,
GIDEON OUIMET,
Superintendent.

MINISTRY OF PUBLIC INSTRUCTION, PROVINCE OF QUEBEC.

REGULATIONS concerning Books, with lists of the Books approved by the Council of Public Instruction, for the use of Schools under the control of School Commissioners and Trustees.

1. Section XXI., 4, Chap. 15, of the Consolidated Statutes provides that the Council of Public Instruction, with the approval of the Lieut-Governor in Council, shall select, or cause to be published, the books, maps, etc., to be used, to the exclusion of others, in the schools of the school commissioners and school trustees, due regard being had to the language, whether English or French, in which the tuition in the several schools is given; but this power of selection does not extend to that of books having reference to religion or morals.

2. Section LXV., 2, Chap. 15, Consolidated Statutes provides that school commissioners and school trustees shall regulate the course of study in each school, and shall allow no other books to be used in the schools under their control than those approved and recommended by the Council of Public Instruction; but the Curé or officiating Minister shall have the exclusive right of selecting the books having reference to religion and morals, for the use of schools for children of his own religious faith.

3. The Council of Public Instruction, at a meeting held on Wednesday, October 20th, 1869, adopted the following rules concerning books:

(1) In future the books submitted for approval shall be simultaneously referred to both Committees of the Council (as re-organized conformably to the Act to amend the law respecting Education in this Province.)

(2) If their approval be recommended by the two Committees, the books shall, accordingly, be approved by the Council, and it shall be stated, in the notice to be given, that they have been approved, on the recommendation of the two Committees, for the use of Catholic schools and of Protestant schools.

(3) If their approval be recommended by only one of the two Committees, the books shall, in like manner, be approved by the Council, but mention shall be made that such approval has been given on the recommendation of the Catholic or of the Protestant Committee, and for the use of Catholic schools, or of Protestant schools, as the case may be.

(4) Persons desirous of submitting books for the approval of the Council shall transmit (for the inspection of members of the two committees) twenty-five copies.

4. The following lists contain the titles, etc., of all books approved by the Council of Public Instruction:

I.—Books approved previously to the re-organization of the Council of Public Instruction in 1869.

N.B.—The letters E., M., A., denote that the books are approved for elementary schools, model schools and academies, respectively.

The letters P. C., denote the books approved exclusively for Protestant or Catholic schools.

The Four Seasons: Being a New No. 3, Nelson's School Series. E.

Murray's Spelling Book. E.

Word-Expositor and Spelling Guide: a School Manual exhibiting the Spelling, Pronunciation, Meaning and Derivation of all the important and peculiar words in the English language; with copious exercises for Examination and Dictation. By George Coutie, M.A., 1863. M.

The British American Reader. By Borthwick. E.

Arithmetic of the Irish National Series. Published by J. Lovell. E.

Walkingham's Arithmetic. E.

Elementary Arithmetic in Decimal Currency, designed for the use of Canadian Schools. By John Hebert Sangster. Second Edition, carefully revised, 1861. Published by John Lovell. E.

A Comprehensive System of Book-Keeping, by Simple and Double Entry. By Thomas R. Johnson, Accountant, Montreal, 1864. E. M.

The Principles of English Grammar. By W. Lennie, 1858. E.

English Word-Book : for the use of schools : a Manual exhibiting the Structure and Etymology of English words. By John Graham, 1863. A.

Lovell's General Geography. By J. G. Hodgins, LL.B., etc., Montreal, 1861. E. M. A.

History of Canada, for the use of Schools and Families. By J. Roy. Seventh Edition, 1864. E. M.

Modern School Geography and Atlas. By James Campbell. E. M.

A School History of Canada and of the other British North American Provinces. By J. G. Hodgins. M. A.

First Lessons in Scientific Agriculture, for Schools, etc. By J. W. Dawson, LL.D., etc., Montreal, 1864. M. A.

Answers to the Programmes on Teaching and Agriculture. By Rev. J. Langevin. Second Edition.

Arithmétique de Bouthillier. Publiée par M. M. Crémazie. E.

Cours d'Arithmétique Commerciale. Imprimé chez Eusébe Senécal, Montreal, 1863. M.

Cours de tenue des livre en partie double et en partie simple. Imprime chez Eusébe Senécal, Montreal, 1861. M.

Abrégé de la Geographie moderne. Publié par la Société d'Education de Québec. E.

La Géographie moderne de M. Holmes. M. A.

Abrégé de l'Histoire du Canada de M. F. X. Garneau. E. M.

Grammaire de Lhomond (édition de Julien), et les Exercices sur la même. E.

La Série des Cours de Grammaire de Julien et les Exercices sur Icfeux. M.

Petit Traité de Grammaire anglaise à l'usage des Ecoles primaries. Par Charles Gosselin, Quebec. E.

Manuel d'Anglais : Grammaire et Thèmes. Par P. Saddler, Paris, 1839. E.

Manuel d'Anglais, thèmes et Syntax. Par le même, Paris, 1840. E.

Grammaire pratique de la langue Anglaise. Par le même, Paris, 1848. M. A.

Cours de versions Anglaises. Par le même, M. A.

Manuel Classique de conversations Francaises et Anglaises. Par le même. M. A.

Nouveau Dictionnaire Portatif Anglais-Francais et Francais-Anglais. Par le mème. M. A.

Précis Elémentaire d'Histoire naturelle. Par Zeller, Paris, 1858. M. A.

Traité d'Agriculture pratique. Par J. F. Perrault, Montreal, 1858. E. M.

Dictionnaire Classique de Bénard. Edition de 1853. Paris.

Réponses aux Programmes de Pédagogie et d'Agriculture Par M. l'abbé Langevin. Seconde édition.

First Latin Reader: for the use of Schools. By A. H. Bryce. Fourth Edition, 1864. A.

Second Latin Reader : with notes and a copious vocabulary. By A. H. Bryce, 1863. A.

First Greek Reader : for use of schools. By A. H. Bryce, 1863.

Grammaire Francaise élémentaire. Par F. P. B. E.

Traité de calcul mental. Par F. E. Juneau. E. M.

Traité élémentaire d'Arithmétique. Par F. X. Toussaint. E. M.

Tenue des livres en partie double et en partie simple. Par Napoléon Lacasse. E. M.

Elementary Latin Grammar. By Dr. Leonard Schmitz. Published by R. Chambers. A.

Elementary Latin Exercises. By the same. Same publisher. A.

Grammar of the Latin language. By the same. Same publisher. A.

Advanced Latin exercises. By the same. Same publisher. A.

School Dictionary of the Latin language. Published by Chambers. A.

Treatise on Practical Mathematics. Published by the same. A.

La Grammaire Completé de Poitevin. M. A.

Traité d'Analogie grammaticale. By the same. M. A.
Traité d'Analyse logique. By same. M. A.
Cours complet de Dictées. By same. M. A.
La Premier livre de l'Enfance. By the same. E.
La Grammaire du Premier Age. By same. E.
La Grammaire élémentaire. By the same. E.
Cours gradué. By the same.
Manuel d'Anglais. Sixième partie: Lecons de Littérature Anglaise. Par P. Sadler, Paris, 1841.
Manuel d'Anglais. Cinquiéme partie: Lecons de Littérture Anglaise. Par P. Sadler, Paris, 1841.
Manuel d'Anglais. Deuxième partie: Versions et Dialogues. Par P. Sadler. Nouvelle édition, Paris, 1857.
Exercises Anglaises, ou cours de Thèmes gradués. Par P. Sadler. Douzième édition, Paris, 1857.
The Duty of the Christian. Published by the brothers of the Christian schools. E. C.
The Metropolitan Illustrated Speller. Published by D. & J. Sadler & Co., New York. E. C.
The Metropolitan Speller and Pictorial Definer. Published by the same. E. C.
The Metropolitan First, Second and Third Readers. Published by the same. E. C.
The Metropolitan Fourth Reader (Edition of 1886, for Canada). Same publishers, Montreal. E. M. C.
Lingards' History of England, abridged: for the use of schools. E. M. C.
Le Devoir du Chrétien. Publié par les Fréres des Ecoles Chrétiennes. E. C.
Histoire Sainte, par demandes et par réponses; suivie d'un abrégé de la vie de N. S. Jéuss-Christ; à l'usage de la jeunesse, Québec, 1852. Imprimée chez, T. Cary. E. C.
Histoire Sainte; par Drioux. Publiée par E. Belin, Paris. E. M. C.
Histoire de France; par le même. E. M. C.
Histoire d'Angleterre, par le même. E. M. C.
Précis de Mithologie, par le même. M. C.
Histoire Ancienne, par le même. M. C.
Histoire Ecclésiastique, par le même. M. C.
Histoire du moyén-age, par le même. M. C.
Nouvelle Méthode pour apprendre à bien lire. Par J. E. Juneau.
The Catholic School Book, containing easy and familiar Lessons for the instruction of youth. C.
Nouvelle Méthode d'Ecriture. Publiée par Eusébe Senécal, en sept cahiers, Montreal, 1865. C.
Psautire de David, suivi des Hymnes qui se chantent dans les differents temps de l'année. Mame, Tours 1858. C.
Lectures Instructives et amusantes; en manuscrit. Par F. P. B. E. C.
Pinnock's Goldsmith's Catechism of the History of England. E. P.
Pinnock's improved edition of Goldsmith's History of England. By W. C. Taylor, LL.D., Montreal; Lovell, 1859. M. A. P.
Grammaire Francaise. By F. P. B. E.
Lectures Instructives et amusantes en manuscrit. By F. P. B. E.
Traité de calcul mental. By F. E. Juneau. E. M.
Tenue des livres en Partie Double et en Partie Simple. By Napoléon Lacasse. E. M.
Syllabaire for Elementary Schools only. By Messrs. Juneau and Lacasse, Quebec, 1868. E.
Traité de chimie agricole. By Dr. Larue, Quebec, 1868. E. M.
Traité d'analyse grammaticale. By Mr. Napoléon Lacasse, Quebec, 1867. E. M.
Grammaire de Bonneau et Lucat, revised. By M. Michaud. E. M.
Traité de l'art épistolaire, Sorel. E. M.
Nouveau éléments de la civilité chrétienne, for elementary schools only. C. Delagrave & Co., Paris. E.
The Edinburgh High School French Grammar. By Charles Schneider, 1866. M. A.

The Edinburgh French Conversation Reader. Same, 1866. M. A.
The Edinburgh High School French Manuel. Same, 1867. M. A.
Abrégé de la Grammaire Francaise. Tenth Edition. By C. J. L. Lafrance, Quebec, 1867. E. M.
Traité Elémentaire d'Arithmétique. By L. H. Bellerose, Montreal, 1867. E. M.
Nouveau Cours de Langue Anglaise, on the plan of Ollendorf. Beauchemin & Valois, Montreal, 1868. E. M.
First Book for the use of Schools. Published by J. Lovell. E. (2).

II.—Books approved subsequently to the re-organization of the Council of Public Instruction in 1869.

Dr. Miles' New Series of Histories of Canada, entitled :—
1o. A New History of Canada, 1534—1867, to serve as a general reader in secondary or superior institutions. A. C. and P.
2o. A School History of Canada, prepared for the elementary and Model schools. E. M. P. and C.
3o. The Child's History of Canada, for the elementary schools. E. C. and P.
Eléments de Botanique et de Phisiologie végétale, suivis d'une petite flore simple et facile de la Province de Québec. Par M. l'Abbé Ovide Brunet. E. M. A. C. and P.
Histoire du Canada, à l'usage des maisons d'éducation. Par le Rév. C. H. Laverdière, A. M. E. M. A. C. and P.
Extracted, by order of the Council, from the register of minutes of meetings, by us.

LOUIS GIARD,
HENRY H. MILES,

QUEBEC, August, 1870. Secretaries of the Council of Public Instruction.

DEPARTMENT OF PUBLIC INSTRUCTION, PROVINCE OF QUEBEC.

LIST OF BOOKS AND APPARATUS for Elementary and Model Schools and Academies for the Protestant Population of Quebec, sanctioned by the Protestant Committee of the Council of Public Instruction, October 11th, 1876.

1. English Readers.

The Canadian National series, viz.:—
First Book of Reading Lessons, with 31 illustrations.
First Book of Reading Lessons, second part, 54 illustrations.
Second Book of Reading Lessons, 50 illustrations.
Third Book of Reading Lessons, 41 illustrations.
Fourth Book of Reading Lessons, 45 illustrations.
Fifth Book of Reading Lessons, 50 illustrations.
The Advanced Book of Reading Lessons.
Constable's series of Readers.
Nelson's do
The Royal do
Andrew's Dramatic Reader.
Borthwick's British American Reader.

2. English Spelling.

The Canadian Spelling Book.
Morell's Manual.
National Spelling Blanks.

3. Writing.

Payson, Dunton and Scribner's Primary and School Courses and National System.
The Spencerian system of Penmanship.

4. Arithmetic.

Smith and McMurchy's Elementary Arithmetic.
Smith and McMurchy's Advanced Arithmetic.
Sangster's Elementary Arithmetic.
do Advanced do
Richardson's Canadian Arithmetic.
McVicar's Example Frame.

5. English Grammar and Composition.

Morrison's Grammar.
Bain's First English Grammar.
Patterson's Composition Book.
Swinton's School Composition.
Dalgleish's Outlines of Composition.
Parker's Exercises.
Lennie's English Grammar.
Bullion's do

6. Geography.

Hodgin's Easy Lessons (Lovell).
do General Geography (Lovell).
Campbell's Geography.
Culkin's Elementary Geography.
do Advanced do

7. History.

Freeman's Outlines of History.
Collier's British History.
Miles' "Child History of Canada."
do School History of Canada.
Hodgin's School History of Canada.
Collier's Great Events of History.

8. Algebra, Geometry, Etc.

Todhunter's Alegebra.
Hensman's do
Euclid.
Young's First Book of Euclid.
Greenleaf's Elementary Algebra.
do Higher Algebra.
Galbraith & Houghton's Trigonometry.
Greenleaf's Elements of Trigonometry.
Chambers's Practical Mathematics.

9. Latin.

Bryce's First Latin Book.
do Latin Grammar.
do Imitative Exercises.
Arnold's First and Second Readers.
do Composition.
Smith's Elementary Grammar.
do Exercises.
do Latin Grammar.
do Advanced Exercises.

10. Greek.

Bryce's First Greek Reader.
do Second do
Arnold's Readers.
do Composition.

11. English Literature.

Seeley's English Classics.
Chambers's English Classics.
Trench's Study of Words.
do English, Past and Present.
Hales' Longer English Poems.
Language Primers (MacMillan).

12. French.

Duval's Juvenile Course.
do Elementary Grammar.
do Lectures Choisies.
Darey's Dominion Phrase Book.
do Lectures Françaises.
De Fiva's Elementary Reader.
Larousse, Cours de première année.
do do seconde do
Beauvoisin's Anecdotes.
Bonnefon's Ecrivains Célèbres.
Edinburgh High School French Grammar. By Chas. Schneider.

13. Science, Etc.

Cutter's Text Book of Physiology.
Gray's "How Plants Grow."
do First Lessons in Botany.
Science Primers of Chemistry, Physics, Geology, etc.
Dana's First Book of Geology.
Dawson's Lessons in Scientific Agriculture.
Dawson's Hand Book of Zoology.
Brunet's Eléments de Botanique.
Houghton's Mechanics.
do Astronomy.
do Hydrostatics.

14. Book-keeping.

Johnson's Book-keeping.
Paysen, Dunton & Scribner's Book-keeping.

15. Singing.

Canadian Three Part Songs.
Le Trésor du Jeune Chanteur Chrétien.

16. Maps.

Nelson's Series.
Johnston's Series.

17. Drawing.

Walter Smith's Freehand Drawing.
Vere Foster's Series of Drawing Books.

18. Art of Teaching.

Abbott's Teacher.
Morrison's Art of Teaching.
Emberson's Art of Teaching.

N. B.—The above list of text books sanctioned by the Protestant committee of the Council for use in Protestant schools, and approved by the Lieutenant-Governor in Council in conformity with section 21, sub-section 4, chap. 15, Consolidated Statutes L. C., will be revised from time to time with a view to including such improved works as may appear. Publishers and others desiring books to be added are requested to send application, with accompanying specimens, to the Department of Public Instruction.

Teachers are expected to insist upon uniformity of text books in each subject in each class of scholars. In the subjects of *Reading*, *Spelling*, *Arithmetic*, *Grammar* and *Geography*, the books first specified in the above list are those specially recommended.

School Boards and School Inspectors are notified that the Protestant committee of the Council of Public Instruction, which is charged by law with the recommendation of suitable text books for use in Protestant schools, desire that perfect uniformity be introduced into all Protestant public schools as soon as possible, and maintained in future.

The foregoing list and directions are issued by order of the Hon. the Superintendent of Public Instruction.

H. H. MILES, LL.D.,
Protestant Secretary of the Department of Public Instruction.

QUEBEC, May, 1877.

PRICE LIST.

(Temporary Supplement to the list of authorized Text Books, etc., for the use of Protestant and English Schools in the Province of Quebec.)

N. B.—The prices given in this list include packing, dispatch by the Montreal departmental agents, Messrs. Dawson Brothers, and delivery by freight, free of charge, to any steamer's port, or railroad station, in the Province of Quebec.

It will be understood, however, that when publishers' present prices (on which the quotations in this list are based) are changed—as in the case of new editions—there will be a proportional increase or diminution in the figures now given. For forms of application or requisition see the other side of this sheet.

1. English Readers.

The Canadian National series, viz:

(†) First Book of Reading Lessons, with 31 illustrations....	$0	45	dozen.
First Book of Reading Lessons, 2nd part, 54 illustrations ..	0	90	
Second Book of Reading Lessons, 50 illustrations.....	2	25	
Third Book of Reading Lessons, 41 illustrations.....	3	50	
Fourth Book of Reading Lessons, 45 illustrations	4	50	
Fifth Book of Reading Lessons, 50 illustrations	5	40	
The Advanced Book of Reading Lessons	5	40	

Nelson's Series, No. 3, $1.45 per dozen; No. 4, $2.42; No. 5, $3.63; No. 6, $4.30; No. 7, $7.26; No. 8, $7.25; No. 9, $4.30; No. 10, $5.64.

Constable's Series, Primer, $0.48 per dozen; 1st, $0.96; 2nd, $1.50; 3rd, $2.10; 4th, $3; 5th, $4.25; 6th, $5.25; Advanced, $12.

Royal Series, No. 1, $0.70 per dozen; No. 2, $1.66; Sequel, $2.15; No. 3, $2.65; No. 4, $3.15; No. 5, $5.60; No. 6, $6.82.

† On this series, and generally on the best known works published by Lovell & Co., and sold by Miller & Co., Montreal, there will be made a slight deduction from the prices quoted, circumstances permitting.

Andrew's Dramatic Reader	$7 25	
Borthwick's British American Reader	....	

2. English Spelling.

The Canadian Spelling Book	2 70	
Morell's Manual	2 36	
National Spelling Blanks	1 06	

3. Writing.

Payson, Dunton and Scribner's Series, English edition of larger, $7 per gross; American of larger, $11.20; smaller, $10.20.		
The Spencerian system of penmanship	8 60	gross.

4. Arithmetic.

Smith and McMurchy's Elementary Arithmetic	$2 15	dozen.
do Advanced Arithmetic	4 30	
Sangster's Elementary Arithmetic	2 15	
do Advanced Arithmetic	4 80	
Richardson's Canadian Arithmetic	2 40	
McVicar's Example Frame	....	

5. English Grammar and Composition.

Morrison's Grammar	4 03	dozen.
Bain's First English Grammar	4 36	
Patterson's Composition Book	....	
Swinton's School Composition	4 85	
Dalgleish's Outlines of Composition	1 50	
Parker's Exercises	11 60	
Lennie's English Grammar	1 00	
Bullion's do	5 20	

6. Geography.

Hodgin's Easy Lessons (Lovell)	4 30	dozen.
do General Geography (Lovell)	8 60	
Campbell's Geography	6 80	
Calkin's Elementary Geography	6 20	
do Advanced Geography	15 50	

7. History.

Freeman's Outline's of History	9 70	dozen.
Collier's British History	5 20	
Miles's "Child's History of Canada"	2 90	
do School History of Canada	5 80	
Hodgin's School History of Canada	4 85	
Collier's Great Events of History	6 75	

8. Algebra, Geometry, etc.

Todhunter's Algebra	5 65	dozen.
Hensman's do	....	
Euclid	8 50	
Young's First Book of Euclid	1 35	

Greenleaf's Elementary Algebra	$16 60	
do Higher Algebra	22 00	
Galbraith & Houghton's Trigonometry	6 85	
Greenleaf's Elements of Trigonometry	11 60	
Chambers's Practical Mathematics	9 70	

9. Latin.

Bryce's First Latin Book	5 44	dozen.
do Latin Grammar	6 75	
do Imitative Exercises	1 35	
Arnold's First and Second Readers	12 95	
do Composition	12 95	
Smith's Elementary Grammar	9 70	
do Exercises	....	
do Latin Grammar	17 45	
do Advanced Exercises	....	

10. Greek.

Bryce's First Greek Reader	6 75	dozen.
do Second do	9 70	
Arnold's Readers	12 95	
do Composition	15 60	

11. English Literature.

Seeley's English Classics	....	
Chambers's do	....	
Trench's Study of Words	13 20	dozen.
do English, Past and Present	13 20	
Hales' Longer English Poems	13 20	
Language Primers (MacMillan)	2 90	

12. French.

Duval's Juvenile Course	1 09	dozen.
do Elementary Grammar	3 87	
do Lectures Choisies	2 90	
Darcy's Dominion Phrase Book	2 68	
do Lectures Françaises	7 27	
De Fivas' Elementary Reader	5 40	
Larousse, Cours de première année	3 77	
do do seconde do	5 20	
Beauvoisin's Anecdotes	....	
Bonnefon's Ecrivains Célèbres	10 50	
Edinburgh High School French Grammar, by Charles Schneider	10 35	

13. Science, etc.

Cutter's Text Book of Physiology	7 00	dozen.
Gray's "How Plants Grow"	12 95	
do First Lesssons in Botany	15 00	
Science Primers of Chemistry, Physics, Geology, etc.	2 90	
Dana's First Book of Geology	24 25	
Dawson's Lessons in Scientific Agriculture	4 85	
do Handbook of Zoology	11 40	

Brunet's Eléments de Botanique	....	
Houghton's Mechanics	$9 55	
do Astronomy	13 60	
do Hydrostatics	9 55	

14. Book-keeping.

Johnson's Book-keeping	3 25	dozen.
Payson, Dunton & Scribner's Book-keeping	18 00	

15. Singing.

Canadian Three Part Songs	2 75	dozen.
Le Trésor du Jeune Chanteur Chrétien	....	

16. Maps.

Nelson's Series	3 50	each.
Johnston's Series	3 15	

17. Drawing.

Walter Smith's Freehand Drawing	....	
Vere Foster's Series of Drawing Books	....	

18. Art of Teaching.

Abbott's Teacher	18 00	dozen.
Morrison's Art of Teaching	13 50	
Emberson's Art of Teaching	4 36	

FORMS OF APPLICATION OR REQUISITION FOR BOOKS, ETC., FROM THE DEPARTMENT OF PUBLIC INSTRUCTION.

(Place and Date.)

To the Superintendent of Public Instruction:

SIR,—The School Commissioners (or School Trustees) of the Municipality of ....., County of ....., at a regular meeting held on the..... of ..... 187.., decided to purchase, for the use of the schools under their control, the following:

(List of the Articles.)

Enclosed is the amount required for payment of the same.
Or (Please retain the amount from the annual grant to our Municipality.)

Address .....

Or (The bearer is authorized to pay for and receive the books, etc., ordered.)

(Signed,) ..... Chairman.
..... Sec.-Treasurer.

(Seal of the School Municipality, if there be one.)

EDUCATION DEPARTMENT.
TORONTO, 18th January, 1879.

SIR,—In further reply to your letter of the 14th ultimo, I have the honour to state that a list of French books will shortly be prepared. Those in use in Quebec may be used.

J. GEO. HODGINS,
Deputy Minister of Education.

Mr. WM. EARL HAYES,
Hawkesbury Mills.

The following is the list of books adopted by the late Minister of Education for French schools having both Protestants and Roman Catholic pupils, the said books being approved for such pupils in Quebec by the Protestant and Roman Catholic committees of the Council of Public Instruction, Quebec.

2. FRENCH TEXT-BOOKS IN USE IN ONTARIO MIXED SCHOOLS.

NOTE.—E. *means suitable for Elementary Schools.* M. *means for Model or more advanced schools.* A. *means for Academic or superior schools.*

In public schools where there are both Protestant and Roman Catholic French scholars, the books sanctioned by the Protestant and Roman Catholic committees of the Council of Public Instruction for Quebec may be used, as follows :—

Arithmétique de Bouthillier. Publiée par MM. Crémazie. E.
Cours d'Arithmétique Commerciale. Imprimé chez Eusébe Senecal. Montreal, 1863. M.
Cours de Tenue des livres, en partie double et en partie simple. Imprime chez Eusébe Senécal. Montreal, 1861. M.
Abrégé de la Géographie Moderne. Publié par la Société d'Education de Québec. E.
La Géographie Moderne de M. Holmes. M. A.
Abrégé de l'Histoire du Canada de M. F. X. Garneau. E. M.
Grammaire de Lhomond (Edition de Julien) et les Exercices sur la même. E.
La Série des Cours de Grammaire de Julien et les Exercices sur Icfeux. M.
Petit Traité de Grammaire Anglaise, à l'usage des Ecoles primaires. Par Charles Gosselin, Québec. E.
Manuel d'Anglais ; Grammaire et Thèmes. Par P. Sadler, Paris, 1829. E.
Manuel d'Anglais, thèmes et Syntax. Par le même, Paris, 1840. E.
Grammaire Pratique de la Langue Anglaise. Par le même, Paris, 1848. M. A.
Cours de versions Anglaises. Par le même. M. A.
Manuel Classique de Conversations Francaises et Anglaises. Par le même. M. A.
Noveau Dictionnaire. Portatif Anglais-Français et Français-Anglais. Par le même. M. A.
Précis Elémentaire d'Histoire Naturelle. Par Zeller. Paris, 1858. M. A.
Traité d'Agriculture Pratique. Par J. F. Perrault, Montreal, 1858. E. M.
Dictionnaire Classique de Bénard. Edition de 1863. Paris.
Réponses aux Programmes de Pedagogie et d'Agriculture. Par M. l'Abbé Langevin. Second edition.
Grammaire Francaise élémentaire. Par F. P. B. E.
Traité de Calcul meutal. Par F. E. Juneau. E. M.
Traité élémentaire d'Arithmétique. Par F. X. Toussaint. E. M.
Tenue des livres, en partie double et en partie simple. Par Napoleon Lacasse. E.M.

La Grammaire Complete de Poitevin. M. A.
Traité d'Analogie Grammaticale. By the same. M. A.
Traité d'Analyse Logique. By same. M. A.
Cours Complet de Dictées. By same. M. A.
Le Premier Livre de l'Enfance. By the same. E.
La Grammaire du Premier Age. By same E.
La Grammaire Elémentaire. By the same. E.
Manuel d'Anglais, Sixième partie : Leçons de Littérature Anglaise. Par P. Sadler. Paris, 1841.
Manuel d'Anglais, Cinquieme partie: Leçons de Littérature Anglaise. Par P. Sadler. Paris, 1841.
Manuel d'Anglais, Deuxième partie: Versions et Dialogues. Par P. Sadler. Nouvelle édition. Paris, 1857.
Exercices Anglaises, on cours de Themes gradués. Par P. Sadler. Douziéme édition. Paris, 1857.
Nouvelle Méthode pour apprendre a bien lire. Par J. E. Juneau.
Grammaire Francaise. By F. P. B. E.
Lectures instructives et amusantes, en manuscript. By F. P. B. E.
Traité de Calcul mental. By F. E. Juneau. E. M.
Syllabaire for elementary schools only. By Messrs Juneau and Lacasse. Quebec 1868. E.
Traité de Chimie Agricole. By Dr. Larue. Quebec, 1868. E. M.
Traité d'Analyse Grammaticale. By E. Napoléon Lacasse. Quebec, 1867. E. M.
Grammaire de Bonneau et Lucat, revised by M. Michaud. E. M.
Traité de l'Art épistolaire. Sorel. E. M.
Abrégê de la Grammaire Française, tenth edition. By C. J. L. Lafrancè. Quebec, 1867. E. M.
Traité elémentaire d'Arithmetique. By L. H. Bellerose. Montreal, 1867. E. M.
Nouveau cours de Langue Anglaise on the plan of Ollendorf. Beauchemin and Valois. Montreal, 1868. E. M.
Elements de Bontanique et de Physiologie vegetale, suivin d'une petite flore simple et facile de la Province de Quebec. Par M. l'Abbé Ovide Brunet. E. M. A.
Histoire du Canada à l'usage des maisons d'edueation. Par, le Rev. C. H. Laverdiére, A. M. E. M. A.

Reported by Education Department,
Quebec, January 7, 1879.

Curran, Sept. 26th, 1884.

The Honourable
The Minister of Education, Toronto.

Sir,—I beg to inforn you that in all the French schools under my supervision there is a too great diversity of books in use, which is much to the disadvantage of the teachers, and to the prejudice of the schools.

Parties who keep a supply of books have frequently complained to me of the inconvenience, for school sections have to change their series according to the teacher's wishes.

At a convention of the French teachers of Prescott and Russell, a series was recommended as autorized text-books for the French schools of Ontario. I, therefore, pray that your Honour will take the matter into consideration, being well aware that an authorized series will supply a want long felt.

I am, Sir, etc.

O. DUFORT,
Assistant. P.S.I.

TORONTO, 1st Oct., 1884.

SIR,—I am directed by the Honourable the Minister of Education, to acknowledge the receipt of your letter of the 26th ult., and to state that he will be glad to consider the list of books recommended by the French teachers of Prescott and Russell, and which he presumes are satisfactory to you, if it is sent him.

I have, etc.

O. DUFORT, Esq., Curran,
Assistant P. S. I., Prescott and Russell.

ALEX. MARLING,
Secretary.

CURRAN, Dec. 5th, 1884.

SIR,—I beg to acknowledge the receipt of your letter of the 1st October, No. 7712, in which you state that the Honourable the Minister of Education will consider the list of books which I recommended to be the authorized Text-books in all the Public and Separate French schools in this Province. I have examined them carefully, and believe they are good. Moreover, I am confident that, if approved, they will greatly tend to raise the standard of our schools.

The accompanying is the list of the books, which I submit for his approval.

Your obedient, etc.

O. DUFORT,
Assistant P. S. I., Prescott and Russell.

Mr. ALEX. MARLING,
Secretary.

Alphabet Phonètique Méthode de Lecture et de Prononciation par Montpetit and Marquette.

Premiere, liv'u de Lecture, par Montpetit and Marquette.
Deuxième " " " "
Froisieme " " " "
Quatrieme " " " "
Cinquieme " " " "

Cours de Lecture a'Haute Vrix par Cabbé P Lagacé, Arithmetique Commerciale par les Fréres des Eales Chretiennes.

Cours Elementaire de Langue Francaise, Fréres des Ecoles Chretiennes.
" Moyen " " " " "
" Supérieur " " " " "
Georgraphie, Illustrie Primaire " " "
" " Intermediaire " " "
Livre d'Epellation " " "
Historie du Canada, " " "
Historie du Angleterre, " " "
Algebre, " " "
Geometrie, " " "
Dessiu Linéaire, " " "

Methode Pratique and Raisonnèe de style et de Composition, par E. Robert.

Dictionnaire Classique Universel, par Ph. Bénard.

Humbly submitted,

O. DUFORT,
Assistant P.S.I.

TORONTO, 15th Dec. 1884.

SIR,—I am directed by the Honourable the Minister of Education to transmit for your opinion, a letter from Mr. Dufort, Assistant Inspector, Prescott and Russell, with list of books proposed for French schools.

The Minister will be obliged if you will send him your views on the subject.

I have, etc.

ALEX. MARLING.
Secretary.

T. GIRARDOT, Esq., Sandwich.
School Inspector No. 1, Essex.

SANDWICH, ONT., January 3rd, 1885.

ALEX. MARLING, Esq.,
Secretary, Education Department, Toronto.

DEAR SIR,—In reply to yours No. 9365 M, enclosing list of French school books, recommended by Mr. Dufort, I have the honour to state that I would much approve the authorization of these books in addition to the list authorized for our French schools. These books are just what are needed, and are suitable for mixed schools.

I have, etc.,

THE. GIRARDOT,
I. P. S. No. 1, Essex.

TORONTO, 7th January, 1885.

DEAR SIR,—I am desired by the Minister to inform you that he has had under consideration the list of books recommended by you on 5th December, and would be further obliged by your causing specimens of them to be sent here.

The publishers will probably send a set for examination without charge.

I have, etc.,

ALEX. MARLING,
Secretary.

O. DUFORT, Esq.,
Assistant Inspector, Prescott and Russell, Curran.

EXTRACT from circular addressed to County Public School Inspectors, January, 1885:—

6. How many schools, in your opinion, will introduce the new readers in April? No reply.

How many after the holidays? Reply—Gage's readers are now being introduced.

TORONTO, 3rd March, 1885.

DEAR SIR,—I am desired by the Minister to mention to you, that the notices in your answers to the printed questions recently addressed to you that "Gage's readers are now being introduced."

The Minister thinks it unfortunate if the old readers should now be adopted in schools that have not hitherto used them, as their authorization only lasts for this year, and the new readers will be ready about 1st April, the first book being already out. Possibly you may, however, mean Gage's edition of the *new readers*.

I have, etc.,

ALEX. MARLING,
Secretary.

O. DUFORT, Esq.,
Assistant P. S. I, Prescott and Russell, Curran.

Mr. A. Marling, Curran, 5th March, 1885.
Secretary Education Department.

Dear Sir,—In my answers to the Hon. the Minister of Education, I meant Gage's edition of the new readers, which I recommended to the teachers. I could not recommend the old readers, as I was well aware that they would soon be on the list of unauthorized books.

You will soon receive the books which I recommended to the Minister with the view of having them authorized for the French schools.

At a convention of the French teachers held last week, the 27th February, the merits of the "Cours Elementaire and Moyen de Langue Francaise" were discussed, and it was found too difficult, therefore I substituted a grammar by E. Robert, which was approved by all the teachers present.

I have also added to the list the following: Methodè de Langue Anglaise by E. Robert, Cours abrege de calcul mental, by E. Robert.

Yours, etc.,

O. DUFORT,
Assistant Inspector.

Toronto, 15th July, 1885.

My Dear Sir,—You will have noticed by the Act of last session that power has been conferred upon county councils to appoint French examiners in addition to those authorized as constituting county boards. I propose calling the attention of county councils specifically to this provision, and in that case it is altogether likely that examinations in French will be held in several counties. In order that these certificates might be as nearly of the same value as possible, I thought it would be wise in the new regulations to indicate some common standard which the various boards of examiners might adopt. Would the entrance to the High Schools be sufficiently high? If so, I could simply indicate that in preparing examination papers the board should have that standard in view. Let me have your opinion at an early day, and oblige.

Yours truly,

G. W. ROSS.

O. Dufort, Esq.,
Assistant Pub. School Inspector, Curran.

Curran, July 20th, 1885.

The Honourable
The Minister of Education.

Sir,—I certainly approve of your intention of having examinations conducted in French, and of having a common standard adopted by the various boards of examiners. Although I remarked that the teachers under my control are advancing in culture and efficiency, still I think that the entrance to the High Schools will be sufficiently high for the present. I have no doubt that this is a right step in the right direction.

In March last I wrote to you, asking that one series of books be authorized for the French schools; and I also got the books sent to you for consideration. I at the same time notified the Secretary of Education of the books being sent, and there it remained ever since. I wish that you would consider the propriety of my demand, and give me an answer. All the teachers, and merchants supplying books to our schools, share my views. It is very annoying and inconvenient for me to find one set of books in one school and another set in the next. Please lend your attention to this request, and oblige.

Yours truly,

O. DUFORT,
Assistant Public School Inspector.

TORONTO, 29th July, 1885.

DEAR SIR,—In reply to your enquiry the Minister desires me to state, that he duly received the books you were kind enough to send, and which are receiving his consideration.

Of those mentioned in your list of 5th December. The following did not reach the Department. Were they sent?

Livre d'Epellation.
Historiè de Angleterre.
Algebre.
Dessin Lineaire.

Yours, etc.,

ALEX. MARLING,
Secretary.

O. DUFORT Esq.,
Assistant P. S. I. Prescott and Russell, Curran.

CURRAN, 19th August, 1885

DEAR SIR,—In reply to your letter of the 29th July, No. 7415, I beg to state that the Livre d'Epellation, Historie d'Angleterre, Algebre, are by the Christian Brothers; Dessin Lineaire by Walter Smith. I got the French teachers to use a small history of England, published by Moir, and they translate it for their pupils.

Yours, etc.,

Mr. A. MARLING,
Secretary, Toronto.

O. DUFORT,
Assistant I. P. S.

CURRAN, 2nd February, 1886.

The Honourable,
THE MINISTER OF EDUCATION,
Toronto.

SIR,—It is now more than a year ago since I applied to you to have a series of books authorized for the French Schools of this Province, the books recommended having been sent in the meantime, and it seems that you have not decided yet. You may object to the reading books as they contain some of the tenets of the Roman Catholic religion, but your Honour will please remark that, of all those I have examined, they contain the least. Our teachers are at a loss to know which to use, and the result is that all kinds of books are to be found in our schools.

By taking at once the matter into consideration, you will oblige,

Yours, etc.,

O. DUFORT,
Assistant I. P. S.

TORONTO, 6th February, 1886.

DEAR SIR,—With reference to the subject of your enquiry, the Minister sends herewith a copy of the new edition of the school regulations, and on page 81 will be found a list of French books, which he has approved for use, and which he hopes will be satisfactory to you. [See page 14 of this Return.]

Yours, etc.,

ALEX. MARLING,
Secretary.

O. DUFORT, ESQ.,
Assistant P. S. I. Prescott and Russell, Curran.

RUSSELL, 25th May, 1886.

SIR,—Our Board of Examiners and our County Council are anxious to have some provision made for the professional training of the teachers of our French schools. The knowledge of the English language possessed by the majority of these teachers is not sufficient to enable them to take advantage of the training given in our present Model school.

We have no school to do the work that could fulfil the requirements of the regulations of the Education Department relating to Model schools, as the largest of our French schools employs two teachers only, and it is, we believe, impossible to procure a full staff of teachers that have received Normal training in Ontario. But the trustees of one of our largest French schools have a suitable building, and are willing to employ for Model school work a principal trained in one of our Normal Schools, with two experienced assistants.

Will you please inform me whether the Minister of Education would make the usual grant of $150 toward such a school?

You will confer a favour by giving an early answer, as it is our wish to have the school in operation for this year's Model school work.

I have, etc.,

W. J. SUMMERBY,
I. P. S.

The SECRETARY,
Education Department, Toronto.

TORONTO, 7th June, 1886.

SIR,—In regard to the establishment of a French Model school, I would recommend that the offer of Inspector Summerby be accepted if he will 'provide a suitable building of at least three rooms, a staff of three teachers, conversant with English as with French, of whom the principal shall hold at least a second class Normal certificate. The assistants should have certificates granted in this Province. Provision should be made to give the teachers a course of instruction in English, and a review of the work they will have to do in school, for many are very weak in their non-professional work. Arrangements could be made to have an examination at the close of the term, in this work as in the professional. It should also be arranged that the principal be free for a part of his time to attend to the students in training.

Yours, etc.,

J. F. WHITE.

ALEX. MARLING Esq.

MEMO.—I would recommend that Inspector Summerby be instructed to open the Model school for the training of French teachers, on the conditions which Mr. White, suggests viz :—That the principal be able to instruct in English as well as in French, and that provision be made by the trustees for relieving him from all public school work during at least half of each day.

J. J. TILLEY.

In accordance with the suggestion in Mr. White's letter, the following general directions for teachers of English and French schools, were next prepared.

The following exercises are submitted for teachers in charge of English and French schools, as an outline of the course to be pursued in order to secure a better knowledge of the English language:—

Colloquial Exercises:

Names of things in school room.
" " " " the street.
" " " " a dwelling.
" " articles of food.
" " " " clothing.
" " parts of the body, etc.
Such exercises may take the form of object lessons.

Reading:

Class I. from Pt. I. Ontario Readers. Some lessons to be memorized.
Class II. from Pt. II. Ontario Readers. Some lessons to be memorized.
Class III. from Bk. II. Ontario Readers. Some lessons to be memorized.
Class IV. from Bk. III. Ontario Readers. Some lessons to be memorized.

Spelling:

Class I. Copying on slate lessons from board and Reader.
" II. As for Class I.; easy oral exercises and dictation.
" III. Copying on slate or paper; dictation oral exercises.
" IV. Copying on paper, dictation oral exercises.

Composition:

Class III. As for second class.
Class IV. Reproduction of stories, description of pictures, of subjects treated in object lessons, etc., letter writing.

Translation:

Class I. Oral; familiar phrases, and from Reader.
" II. " " " " " "
" III. Oral and written, " " " "
" IV. " " " " " " "
Special attention to be given to English idioms.

Grammar:

In classes I.–III. inclusive, the instruction should consist chiefly in a systematically arranged series of exercises, oral and written, in the correct use of language; the materials to be drawn from the object and reading lessons of the respective grades.

Pronunciation:

To receive special attention in all grades. Teachers should consult Ayres' Orthoëpist.

Time:

Classes I., II., at least two hours a week.
" III., IV., at least four hours a week.

Toronto, September, 1885.

TORONTO, 14th June, 1886.

DEAR SIR,—Your letter of the 25th ult., has been under consideration, and you are hereby authorized to open the Model school for the training of French teachers, on the following conditions :—

1. That the principal be able to instruct in English as well as in French and hold at least a second class Normal school certificate.

2. That provision be made by the trustees for relieving him from all public school work during at least half of each day.

3. That the other two teachers be also conversant with both English and French and hold certificates granted in this Province.

4. Provision should be made to give the teachers a course of instruction in English and a review of the work they will have to do in school, many being weak in their non-professional work.

Arrangements could be made for an examination at the close of the term in this work, as well as the professional.

5. That a suitable building of at least three rooms, be provided.

The usual grant of $150 will be made on the above conditions.

Yours, etc.,

ALEX. MARLING,
Secretary.

W. J. SUMMERBY Esq.,
I. P. S. Prescott and Russell, Russell.

RUSSELL, 15th November, 1886.

SIR,—Referring to the proposed Model school for the training of French teachers. I have the honour to report for the information of the Honourable the Minister of Education, that we were unable to establish it owing to the fact that no suitable and properly qualified principal could be found to take charge of it.

I have, etc.,

W. J. SUMMERBY,
Inspector Public Schools.

The SECRETARY,
Education Department, Toronto.

TORONTO, 20th January, 1887.

MY DEAR SIR,—As I do not quite understand the position of those schools in some of the eastern counties where French and English are taught, I have asked the inspectors having such schools in charge to meet me at my office at 2 o'clock, on Thursday, 27th instant, in order that I might consult with them as to the best means of providing teachers and introducing the study of English. A notice similar to this has been sent to Messrs. Dufort (your colleague) and Mr. Girardot, of Essex.

Your travelling expenses will be paid by the Department.

Your truly,

G. W. ROSS.

W. J. SUMMERBY, Esq.,
Inspector Public Schools, Russell.

Similar letters sent same time to Messrs. Dufort and Girardot.

TORONTO, 10th February, 1887.

MY DEAR SIR,—Would you be good enough at your earliest convenience to give me a statement showing. (1) The number of schools in your inspectoral division in which both French and English are taught. (2) The number in which English only is taught. (3) The number in which French only is taught. (4) The number of teachers, holding legal certificates not extended. (5) The number of teachers holding extended certificates. (6) The number of teachers unable to teach English, and (7) The number of teachers examined for district certificates in both English and French. It has been alleged that in the schools in which English is spoken, the authorized text-books are not used. Will you please furnish me with a statement shewing the text-books used in the English subjects, also the text-books used in the French subjects. I send you herewith the correspondence which appeared in the Toronto *Mail* some time ago criticizing the French schools in your inspectoral division, which I have marked. Kindly furnish me with such information in regard to the statements therein made as you are able to obtain.

Please return correspondence.

Yours truly,

G. W. ROSS.

W. J. SUMMERBY, Esq.,
Inspector Public Schools, Russell.

P.S.—Please consult your colleague, Mr. Dufort, and let report be a joint report.

G. W. R.

RUSSELL, 23rd February, 1887.

To the Hon. G. W. Ross,
Minister of Education, Toronto.

DEAR SIR,—I have the honour to submit the information asked for in your letter of the 10th instant, together with such additional information as I think may be of service to you.

	Schools.	Depts.
1. Schools in this Inspectorate in which both French and English are taught	44	47
2. Schools in which English only is taught	61	71
3. Schools in which French only is taught	21	27
4. Classed as English schools, (visited by Mr. S.)	.	79
5. Classed as French schools, (visited by Mr. D.)	..	66
6. English teachers holding legal certificates not extended. (Second class, 15; third class, 23; district, 25; O. C. B., 1) Note—Twelve of our third class teachers have passed the second non-professional examination, and three of our teachers hold first-class non-professional certificates	..	64
7. English teachers holding third class extensions		3
8. " " " temporary certificates		5
9. English schools closed for the winter, 6; vacant, 1		7
10. French teachers holding extensions		2
11. " " " District certificates, (16 temporary)		59
12. French teachers holding other certificates, (second class, 2; O. C. B., 1)		3
13. French Schools closed		2
14. Teachers unable to teach English		6

	Schools.	Depts.
15. Teachers examined for District certificates. (1885)...		46
In both French and English, (1886)		45

Note—Only those who took translation are put down here, a greater number took English reading.

English Examinations passed by French Teachers.

In 1885 there were 65 French candidates for District certificates. Of these 6 took English Grammar, 5 English Composition, 44 Translation, and 65 English reading.

In 1886 there were 59 French candidates; 4 took all the English subjects, 41 translation, and 53 English reading.

In explanation of the seemingly large number of candidates it may be pointed out that Mr. White sends his French teachers to our examination, and we require many of our weaker candidates to come up each year.

Unauthorized Text-book.

The allegation that the authorized English text-books are not used is untrue. I have met with a few unauthorized primers in geography and history, but in every instance their use has been discontinued on its being pointed out to the teacher that they were not authorized. Mr. Dufort assures me that in the schools under his charge only the authorized text-books are used in the English subjects.

Text-books used in English Schools.

The following are the text-books used in our schools:—

Reading.—Ontario Readers.
Arithmetic.—Kirkland & Scott, Smith & McMurchy, H. Smith.
Geography.—Campbell, Lovell's Intermediate, Calkin.
Grammar.—Swinton's Language Lessons, Mason.
History.—Collier, Thompson, Epoch Primer, Jeffer's Public School History of England and Canada. (None but the last now bought.)
Algebra.—H. Smith, Todhunter.
Euclid.—H. Smith, Todhunter, Potts.
Science.—Authorized primers.
Drawing.—Authorized books, Walter Smith's cards (a few).

Text-books used in French Schools.

English Subjects and Drawing.—Same as above.
French Reading.—Montpetit's series, Prof. Lagace's Treatise on Reading. A few schools use the Syllabaire des Ecoles Chetiennes.
Arithmetic.—Christian Brothers, Kirkland & Scott.
Geography.—Christian Brothers, Campbell.
French Grammar.—Robert (principally), Larousse, Christian Brothers.
History.—Toussaint's (Canada), Drioux's (England), Christian Brothers.

REMARKS ON THE "MAIL" CORRESPONDENCE.

Catechism in the Clarence Creek School.

1. The pupils attending this school are exclusively French Roman Catholics, and it is quite possible that the catechism is taught, but it is a gross exaggeration to say that it is

the principal text-book. In all cases in which the Inspector's attention has been called to the subject, the regulations have been pointed out to the school authorities, and they have been told that catechism, if taught at all, must be taught after regular school hours.

English Text-Book at Clarence Creek.

English readers are for sale in nearly all the French settlements. If they were not to be had in the village, they could have been procured within a few miles—three or four.

Embrun School—Mr. Boult's English.

2. Mr. Boult speaks and teaches English fairly well. At the time of the correspondent's visit about twenty-five pupils were studying English. The exercises consist of reading, spelling, and translation.

The School House.

The building is small for the number of pupils in the section, but last winter the trustees promised me that they would this winter make preparations to build next summer, and I believe they are doing so.

Text-books.

Mr. Boult could have told the correspondent that the Ontario readers were used in the school. The statement that "the nuns were soon going to take charge of the school" had reference to a rumor that a separate school was soon to be established in the village.

Character of the French Readers.

The correspondent's criticisms, though biassed, are in the main borne out by a perusal of the books; but we may note:—

(*a*) That the primer used in most of the schools is adapted to the phonetic method of teaching and that but half of two of the thirty-six pages mention religious subjects. The other primer, still used in a few schools, treats exclusively of religion and religious subjects.

(*b*) Of the other books none but the first can be said to treat "mainly" of religious subjects. They contain lessons on the three kingdoms of nature, on our domestic animals, plants, cereals, fruit trees, farm buildings, implements, etc. Surely these things should interest the general public.

Miss McFeeley's School.

3. This school is classed as an English school, but about half of the ratepayers and perhaps more than half of the pupils are French. Miss McFeeley taught English only, and the French people were anxious to have their children learn to read their mother tongue.

Before Miss McFeeley was engaged the trustees asked me to find them a teacher that could teach both languages, but we were unable to find one properly qualified. Miss McFeeley was then engaged, but the understanding was that when she left, a teacher capable of teaching both languages was to be engaged, if a suitable one could be found.

Miss McFeeley was not driven away. She left at the end of her term of engagement to attend the Normal School, where she now is. Her successor is one of the O'Callaghan sisters who are afterward spoken so highly of in the Hawkesbury letter. In South Indian she is to be a "subservient tool of the cure," in Hawkesbury she is "an unusually accomplished person" and "a sacrifice to priestly wrath."

L'Orignal School.

4. The correspondent seems to think that catechism caused all the trouble at L'Orignal; but a bad feeling had been growing up between the two nationalities for some years. More and more the cleavage in all the elections, parliamentary and municipal, was along the line of nationality and this had as much to do with the trouble as school matters proper.

The real trouble in school matters at L'Orignal is one that is felt more or less everywhere. It is this: the ratepayer that pays a tax of five cents has the same voice in the affairs of the school as the one that pays a hundred dollars. It is an almost universal complaint that those that pay the most taxes derive the least benefit from the school. In L'Orignal, unfortunately, the questions of race and religion come in to aggravate this complaint. The French people have two-thirds of the pupils while they pay but one-third of the taxes.

The Average Attendance.

5. It may be noticed that though our average is low, it is not by any means the lowest in the Province; for, according to the last published report of the Minister, there are sixteen counties that have as low an average as we have.

Teachers.

Our schools are classed as English and French. Mr. Dufort visits the French schools, I visit the English. Hence the reference to the "eighty-one teachers in our English schools." (Two English departments have been closed since last June). The majority of the French teachers teach English, though they are not classed as English teachers.

What Mr. Summerby said to the Correspondent.

6. The correspondent hints that I kept back information that would tell against the Government. What I tried to make him understand was, that I did not wish to be represented as going out of my way, on the eve of a general election, to furnish the opposition with information that might be used unfairly to injure the Government. I told him distinctly that though there was certainly room for improvement, yet the French text-books now in use are in every way preferable to those used when I came to the inspectorate, that our system of qualifying teachers for the French schools is better, and that methods of teaching had much improved.

County Council.

The correspondent contradicts himself in saying that the French element preponderates in the county council. Elsewhere he tells us truly that the numbers were eleven English to ten French. The French have never had a majority in the county council.

English Teacher in French Schools.

The life of an English teacher in a French school would, perhaps, be "unbearable." The pupils would not understand the teacher and the teacher would not understand the pupils.

English in French Schools.

It will be noticed that in one place the correspondent says that I told him that "there is a little English taught in most of the French schools," while a little farther on he says that I told him "there were between sixty and seventy French schools, but in some of them there is a little English taught."

Qualifications of French Teachers.

The correspondent seems to have come to the counties with the idea that all the French teachers held permits, and were never required to attend a public examination. It was in trying to disabuse his mind of this idea, and in explaining to him our system of examination for district certificates that I stated we had the authority of the department for what we had done.

Teachers Examined in French only.

As to the candidates examined in French only, there were certainly some. The figures given above show that there were 6 out of 124 candidates examined in 1885 and 1886. Of course, it is true, that many of these examined in English knew but little of it, still they all knew how to read.

Hawkesbury Affairs.

7. There are six teachers employed in the Hawkesbury public schools, three teach English only, and three French only. Any French child that wishes to learn English attends the English departments.

The O'Callaghan Sisters.

It has already been mentioned that one of these ladies is now at South Indian as Miss McFeeley's successor. It is, I think, likely that there is a good deal of truth in the correspondent's statements respecting the agitation to get rid of these teachers. Mr. Dufort reported favourably on the teaching of one of them, but unfavourably on that of the other two teachers, one of the sisters and young Lefebvre, who were, no doubt, poor teachers.

French Teachers now Employed in Hawkesbury.

Of the teachers now employed in Hawkesbury, one holds a certificate from the Laval Normal School, and is temporarily qualified till the next examination, the second holds a district certificate, and the third, who failed at last summer's examination, is temporarily qualified to teach the infant class.

Plantagenet Schools.

8. The real trouble here was the question of expense, but it is true that the question of race may have had something to do with it. New comers from Quebec Province who had been used to paying teachers $200 a year were very much averse to paying $500 and $450 to two men for doing the work that they thought could be done for half the money. The school was increasing, so that a third teacher was needed, and it was proposed to have a headmaster and two female assistants for the new year.

It may be well to remember that here, as at L'Orignal, the English speaking people, though in a minority, pay the greater part of the taxes. Though the race cry may have been heard among the people, I believe the trustees desired to maintain the efficiency of the school, and honestly thought that they could do this by changing the staff, while lessening the expense to the section. In fact two of the three trustees were elected by the English speaking party. So that the talk about a "conspiracy" is all nonsense.

The financial question was explained to the masters, and they were given to understand that their resignations would be gladly accepted. They were at the same time told that if they remained their salaries would have to be lowered. Mr. Ross immediately engaged in a neighbouring county at his old salary, while Mr. Belanger, the French master, not finding a new opening remained at a reduced salary. Another English

master was then employed at a salary lower than that paid to Mr. Ross. The work in this school is now arranged as follows :—Those pupils that take English only are taught by the English master. The other pupils learning both languages, are taught by the French master and an English assistant, both of whom speak and teach both languages.

Concluding Remarks.

Work done in some of our French Schools.

To give you an idea of the character of the work done in English, in some of our French schools, I may here draw your attention to the fact that I mentioned to you when I was in Toronto last month: Four pupils from one of these schools passed the entrance examination to the High School during the year 1886, one in July and three in December. All four of these pupils speak and write both languages; two of them are the children of French speaking parents; two of English speaking parents, and one of them is but eleven years of age. One of the French pupils made a perfect paper in dictation, spelling every word correctly and beating all the English speaking pupils.

Work done in our English Schools.—Our Schools compared with the Schools in adjoining Counties.

In the western part of the inspectorate there are no high schools, and advanced work must be done in the public schools, or pupils wishing to go forward in their studies have to leave home to attend school. Some of our pupils attend high schools in adjoining counties, and as in some of these schools medals and scholarships are awarded pupils taking the highest marks at the entrance examination, we have thus a means of comparing our work with that done in neighbouring counties. Several times of late years our pupils have taken gold and silver medals at the Kemptville High School, and they have also taken scholarships at Ottawa Collegiate Institute.

Public Schools sending candidates to the Teachers' Examination.

In some of our public schools pupils are prepared for the teachers' examinations. During the past two years several have passed district examinations; three the third-class examination, and one the second-class examination. The second-class candidate was but fourteen years of age and had passed the third-class examination the previous year.

All of which is respectfully submitted.

W. J. SUMMERBY.

Russell, 31st January, 1887.

Sir,—My assistant, Mr. Dufort, informs me that on his last visit to S. S. No. 13, Alfred, and S. S. No. 19, E. Hawkesbury, he found unqualified teachers in charge of the schools; that he reported the fact to the trustees, and that they have presisted in keeping these teachers in their employ.

As we have been similarly troubled before, Mr. Dufort thinks it would be advisable to withhold the school grants from these schools until such time as they comply with the law.

Therefore, ask the Minister for permission to withhold them.

I have, etc.

W. J. SUMMERBY,
I. P. S.

The Secretary,
Education Department, Toronto.

TORONTO, 3rd Feby. 1887.

GENTLEMEN,—It is reported to the Minister that the teacher in your school is not legally qualified, and he desires that you will explain why such an appointment has been made.

Yours, etc.

ALEX. MARLING,
Secretary.

The TRUSTEES,
S. S. No. 13, Alfred, Lefaivre.

Same to the Trustees, S. S. No. 19, E. Hawkesbury, St. Eugene.

TORONTO, 3rd Feby. 1887.

DEAR SIR,—In reply to your letter of the 31st ultimo, the Minister desires me to state that he has written to the school sections mentioned by you for an explanation.

Yours, etc.

ALEX MARLING,
Secretary.

W. J. SUMMERBY, Esq.,
P. S. I., Russell.

LEFAIVRE, 10th Feby. 1887.

DEAR SIR,—If we did employ a teacher which was not legally qualified, it was because we could not find one which was qualified. We thought in January our school was going to be closed till July next, because we could find no teacher. We have found one, which Mr. Dufort told us to engage her, so our school is opened since the 9th of February.

Yours, etc.

ALFRED LANGAM,
JOSEPH CODIEUX.

RUSSELL, 11th March, 1887

SIR,—I have the honour to report as follows on the letter accompanying your memorandum (2153), of the 26th ult., referring to the withholding of school grant from S. S. No. 13, Alfred.

We (the inspectors), admit that at the time this teacher was engaged, there were no qualified teachers to be had, but we think that if the trustees had looked for a teacher in time, they could have found a qualified one at a reasonable salary.

In cases of this kind we are always willing to qualify some competent person to teach till the next examination, if such person can be found, and the trustees make the proper application, but in this case the trustees engaged an unqualified teacher; did not send her to the inspector for examination, and made no application to have her qualified.

The trustees have complied with the regulations for the present half year, the teacher now in charge of the school having been temporarily qualified by Mr. Dufort.

I have, etc.

W. J. SUMMERBY,
I. P. S.

The SECRETARY,
Education Department, Toronto.

St. Eugène, 28th Fevrier, 1887.

A. Marling.

Monsieur,—En rèponse a la votre en date du 3rd Fevrier, derneir je dois vous avoner que nons avons une certainé partié terrain qui ne page point à nôtre ecole et qui se trouve tout pres nôtre ecole par le fait mênu cela met nôtre arrondessement plus petite et dans l'impossibilitu de pouvoir engage une institutricè d'ien haut prix celle que nons avons tout l'arrondessement en est tris satisfait nons en avons jamais en de meilheur ji couis fair pour le mieux je suis pénie pouvoir faire outrement.

Votre, etc.,

HELAIRE BINETTE, Jr., I. A. A. B.,
Secretaire S. S. 19.
E. Hawkesbury.

Russell, 11th March, 1887.

Sir,—I have the honour to report as follows, on the letter accompanying your memorandum (2328) of the 4th, inst., in reference to the withholding of the school grant from School Section No. 19, East Hawkesbury.

Among the reasons given by the trustees in excuse of their employment of an unqualified teacher, are these :—

1. Certain lands not included in their section, are near their school ; the section is thus small and unable to pay a high salary.

2. The people of the section are all satisfied with the teacher employed, and say they never had a better.

On these I may remark :

1. The section is certainly a small one, but there are weaker sections in the townships that employ regularly qualified teachers.

2. The fact that the people are satisfied with the teacher, is no proof that she is a good one ; many sections are satisfied with any teacher that is cheap.

We are always willing to make allowances for weak sections, and to grant temporary certificates if necessary ; but hold that the Board of Examiners or the Inspector, and not the people and the trustees are to be the judges of the teacher's fitness for the position.

The teacher employed in this school was temporarily qualified for the first half of 1886 ; it was explained to her that she would have to attend the examination in July, and she was duly notified of the date of the examination, but neglected to attend.

In such cases we can do nothing but refuse to issue a second temporary certificate.

I have, etc.,

W. J. SUMMERBY,
I. P. S.

The Secretary,
Education Department, Toronto.

L'Orignal, 13th April, 1886.

To the Honourable
The Minister of Education.

Dear Sir,—I have been requested by a number of parties to inquire of you respecting the amendment lately added to the School Act, by which Protestant minorities were enabled to form separate schools in sections such as this—Prescott County—where the Roman Catholic population is in a majority.

I submit a question or two, hoping that you will, with your accustomed kindness, answer them. 1. Is any provision made in the Act for a division of the school building and yard where the school house is large enough to accommodate both parties? If the party separating is obliged to leave the school, do you think that in a particular case like this one in L'Orignal, where an $8,000 building was erected by the Protestant population with but very little assistance—I think about one-fourth from the Roman Catholic—and the Protestants still paying the greater part of the taxes, but the Roman Catholics having the majority of votes, and having elected at the last election for trustees a full Board of Roman Catholics, that the Roman Catholics who hold the school could not be forced to divide the school, or agree to buy the Protestant interest in it or sell theirs? 3. When do the new amendments come in force as law, and can be used as such?

Hoping you will be pleased to enlighten us.

I remain, etc.,

J. HOWARD HAY.

Address—
J. Howard Hay,
L'Orignal, Ont.

Toronto, 20th April, 1886.

Dear Sir,—On the subject of your letter of the 13th inst., it is the opinion of the Minister that the position of the supporters of a Protestant separate school is very similar to that of the supporters of a Roman Catholic separate school.

On the establishment of a separate school the supporters thereof become relieved from public school rates, but the law does not give them a claim for a refund of any portion of the value of the public school building erected while they were still public school supporters. The law does not provide for the holding of a public school and a separate school in the same building.

The Act passed this year was a consolidation of the law already in existence, excepting in one or two particulars, and is now in operation.

Yours, etc.,

ALEX. MARLING,
Secretary.

J. Howard Hay, Esq.,
L'Orignal, Ont.

L'Orignal, Ont., 9th December, 1886.

Sir,—I beg to hand you herewith a petition signed by the Protestant ratepayers of public school section No. 1, in the village of L'Orignal, respecting the public school of said section, and also with regard to the interests of a separate school for Protestants, which is shortly to be established within the municipality.

I hope you may be pleased to give the earnest prayer of the petitioners your early and careful attention.

I have, etc.,

EDEN P. JOHNSON.

Hon. Geo. W. Ross,
Minister of Education, Toronto, Ont.

To the Hon. Geo. W. Ross,
Minister of Education, Toronto.

Sir,—The petition of the undersigned Protestant ratepayers of public school section No. 1, in the village of L'Orignal, County of Prescott, humbly sheweth:

That at the last annual meeting for the election of trustees for this school section, the Roman Catholic ratepayers succeeded in electing all the new members, and thus obtained a controlling influence on the school board—the board immediately after the said election being composed of four Roman Catholic members and two Protestant members—the last two mentioned being respectively the chairman and the secretary-treasurer of the board.

At the first meeting held by the new board, one of the newly elected Roman Catholic members was appointed to the position of chairman and another to the position of secretary-treasurer, and very shortly afterward the board decided to employ none but French Roman Catholic teachers in the school. The school was at that time conducted by a duly qualified Protestant headmaster, a Protestant female English assistant teacher, and a Roman Catholic French assistant female teacher, all of whom were giving satisfaction in the discharge of their respective duties.

Notwithstanding the presentation to the board of a very numerously and respectably signed petition to the contrary, at the end of the then current half year, all the said teachers were discharged, and two French Roman Catholic teachers—a male and a female—were engaged to take control of the school. Mr. Campbell, the late secretary-treasurer of the board had, in the meantime, resigned his position on the board, and his place had not then, and has not yet, been filled.

The Protestant ratepayers of the section then unanimously decided that they would apply for the establishment of a separate school for Protestants, under the provisions of the Act of this Province respecting Separate Schools, but as such a school could not be legally put into operation before the commencement of the new year. it was decided in the meantime to organize a private school for the balance of the present year, and pay the necessary expense thereof with their own voluntary contributions. Such a school has been opened, and is now in active and successful operation here.

The school building is a large and commodious brick structure, which was erected in the year 1877, at an expense of about $7,500, principally borne by the ratepayers of this school section and consists of a front building containing a large hall with double staircases and four good school rooms—two below stairs and two above stairs—with a wing running back from the main building containing a hall with staircase and two good school rooms—one below stairs and one above stairs—the wing having been intended for the accommodation of a high school.

Until the month of July last but three rooms had ever been occupied in the whole building; one of the lower rooms in the main building having been occupied by the pupils under the French assistant teacher, and the two upper rooms by the pupils under the head master and the English assistant teacher, respectively. During the current half year only two of the four rooms in the main building have been used.

On completion of the arrangement for the private school, application was made to the Board on behalf of the same, for permission to use one of the two unoccupied rooms in the main building but the said Board of Public School Trustees peremptorily refused such request and the said private school has since been conducted in one of the rooms belonging to the high school part of the building, by permission obtained from the High School Trustees.

Pursuant to the provisions of the Ontario Statutes 49 Vic. Chap. 46, application has recently been made in writing to the Public School Trustee Board of this school section for permission to establish a separate school for Protestants within the limits of this school section and the said Board has been compelled to pass a resolution authorizing the establishment of such a school at the commencement of the incoming year.

At the time of passing the said resolution the said Board of Public School Trustees adopted another resolution declaring that the proposed Protestant separate school should not be allowed to occupy the high school building.

We are creditably informed and believe that our public school, as now conducted, is not kept in accordance with the rules and regulations, and the laws respecting public schools in this Province. That the Roman Catholic Church Catechism is regularly taught there in school hours, and that much of the time and attention of the pupils of the said school has been, and is, constantly taken up with their observance of the forms and ceremonies of the Roman Catholic Church.

A careful examination of the assessment roll of this municipality for the present year shows that the total assessment of this school section amounts to $120,765, of which sum $79,515 represents the assessed value of property owned by Protestant ratepayers, and the balance $41,250 is owned by Roman Catholic ratepayers, and included in the latter amount are the properties of several prominent supporters of the existing private school, and who are known to be favourable to the establishment of a separate school for Protestants, and are likely to be supporters of such a school.

It is quite clear that the Trustees of the public school of this section will do all in their power to exclude the protestant separate school from the school building which the supporters of the latter have so largely contributed to build, and that no amicable arrangement for a division of the school building is likely to be willingly come to with them.

Therefore, your petitioners humbly pray that you may, in the judicious exercises of your official authority cause a careful investigation to be made in the management and condition of our public school with a view of guarding and protecting it against any of the objectionable features to which reference had been made, and keeping it strictly within the legitimate lines which are laid down in the code of laws respecting public schools in this Province.

And, also, that you may at as early a date as possible, take steps to secure for the Protestant separate school, which will be put into operation here at the commencement of the approaching new year, absolute control of one-half of the said public school building for the purposes of said school.

And your petitioners as in duty bound will ever pray.

L'Orignal, 1st December, 1886.

JOHN MILLAR,
M. MILLAR,
DANIEL BUCHAN,
WILLIAM WRIGHT,
FREDERICK WINTERS,
EDEN P. JOHNSON,
JNO. O'BRIAN,
ROBERT HALL,
JAMES BANFORD,
GEO. M. CUMMINGS,
GEORGE GALE,
ROBERT R. McEVOY,
WILLIAM CROOKS,
JAMES F. McEVOY,
JOHN O'BRIAN Jr.,
A. O'BRIAN,
JOHN FRASER,
JOHN D. CAMERON,
WATSON LITLE,
JOHN FAIRLIE,
A. W. EDWARDS,
J. L. BATES,
NATHANIEL BATES,
E. A. HALL,
ROBERT DONALDSON,
P. H. McINTOSH,
M. B. JORDON,
MORTIMER CUMMINGS,
WM. BANFORD,
S. W. WRIGHT,
E. A. JOHNSTON, (Warden U. C. P. & R.),
COLIN G. O'BRIAN,
JOHN COCHRANE,
JAS. UNSWORTH,
W. J. HALL,
JOHN CAMPBELL,
R. G. CAMPBELL,
ANDREW BUCHAN,
JAMES BUCHAN,
ROBERT HAMILTON,
EDWIN CUMMINGS,
FREDERICK CLARE,
JOHN JOHNSTONE,
JOHN FRELIGH,
E. H. CLARE,
DAVID HANNAH,
J. H. HALL.

EDUCATION DEPARTMENT,
TORONTO, 14th Dec., 1886.

DEAR SIR,—The Minister has had under consideration your letter of 9th instant, and the accompanying petition by the Protestant ratepayers of L'Orignal, and he requests that you will inform him of the title under which the school building is held, and also transmit copy of the deed.

Yours, etc.,
ALEX. MARLING,
Secretary.

E. P. JOHNSON, Esq.,
L'Orignal.

L'ORIGNAL, 17th Dec., 1886.

DEAR SIR,—I beg to acknowledge the receipt of your letter of the 14th instant, No. 6165 C. 2, and have to state in reply for the information of the Minister that the title under which the school building is held by the Board of School Trustees of the village of L'Orignal, is a deed in fee simple of the land upon which the said building has been erected. The title is perfect, and the lot not encumbered. I enclose herewith as requested, a certified copy of the deed.

Yours very sincerely,
EDEN P. JOHNSON.

ALEX. MARLING, Esq.,
Secretary Education Department, Toronto.

THIS INDENTURE, made the twenty-fifth day of September, in the year of our Lord one thousand eight hundred and seventy-seven, in pursuance of the Act respecting Short Forms of Conveyances.

BETWEEN

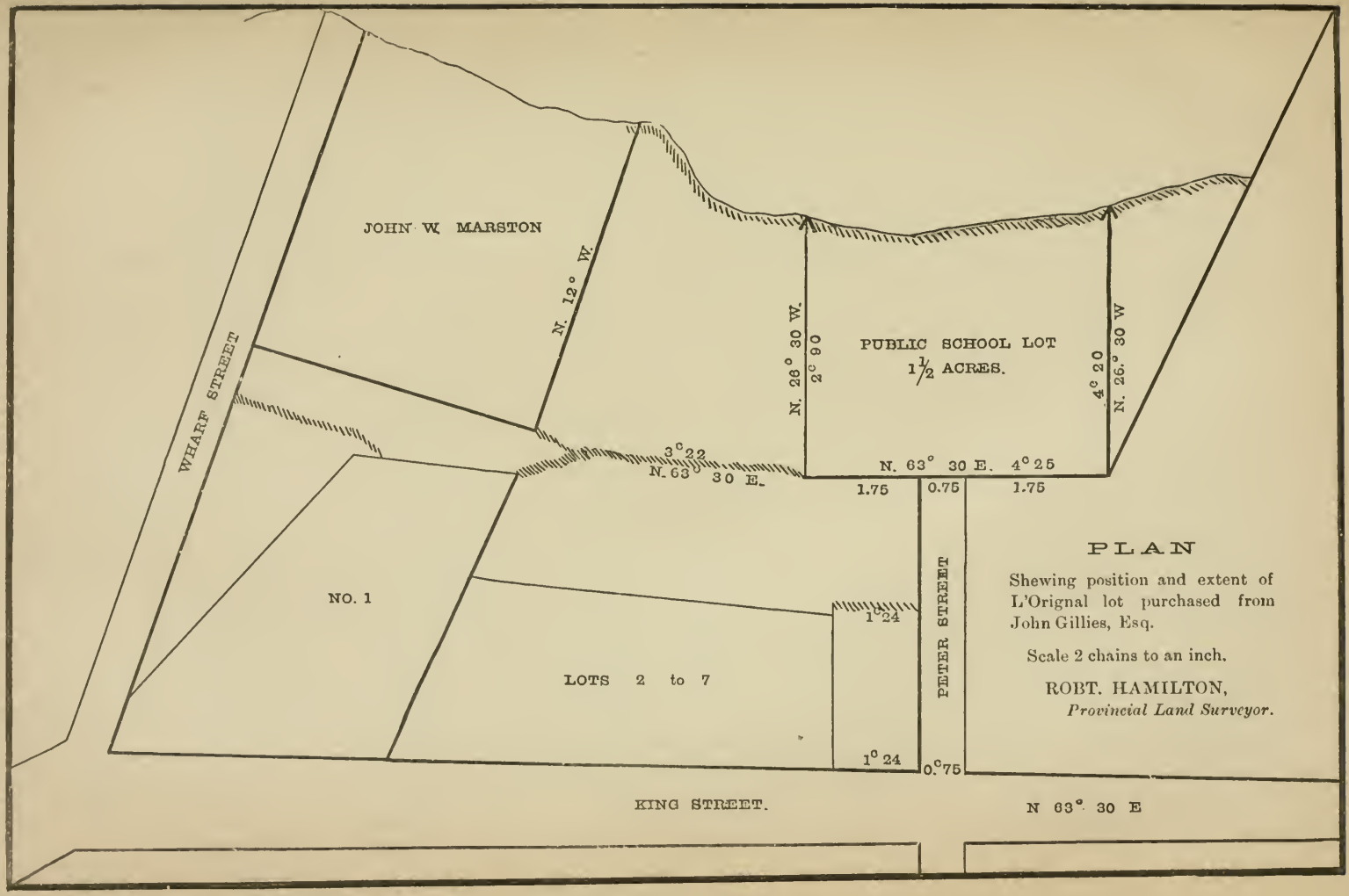
John Gillies, the Elder, of Carleton Place, in the County of Lanark, in the Province of Ontario, gentleman, of the first part;

The Board of School Trustees of the Village of L'Orignal, in the County of Prescott, and Province aforesaid, of the second part; and

Mary Gillies, wife of the said party of the first part, made a party hereto for the purpose of barring her dower merely, of the third part.

Witnesseth, That in consideration of six hundred dollars of the lawful money of Canada now paid by the said party of the second part to the said party of the first part, the receipt whereof is hereby acknowledged, he, the said party of the first part doth grant unto the said party of the second part, their successors and assigns, as such School Board forever, all and singular, that certain parcel and tract of land and premises situate, lying, and being in the Village of L'Orignal and County of Prescott, which may be known and described as follows:

Commencing at a post planted at the south-westerly corner of the parcel hereby conveyed or intended so to be, at the distance of three chains and twenty-three links on a course north sixty-three degrees thirty minutes east, magnetically from the south-east corner of that certain village lot now owned and occupied by John Wurtele Marston, lying on the east side of Wharf Street, and fronting on the Ottawa River; thence north twenty-six degrees thirty minutes west two chains and ninety links, more or less, to the high water mark of the Ottawa River; thence returning along said line to the place of commencement; thence continuing on the said course north sixty-three degrees thirty minutes east four chains and twenty-five links to a post; thence north twenty-six degrees thirty minutes west four chains and thirty links, more or less, to the high water mark of the Ottawa River; thence in a south-westerly direction against the stream along the high water mark of the said Ottawa River, to the intersection of the western boundary of the said parcel above described;


JOHN W. MARSTON
N. 12° W.
WHARF STREET
N. 28° 30 W.
2° 90
PUBLIC SCHOOL LOT
1½ ACRES.
4° 20
N. 26° 30 W
3° 22
N. 63° 30 E.
N. 63° 30 E. 4° 25
1.75
0.75
1.75
NO. 1
LOTS 2 to 7
1° 24
PETER STREET
1° 24
0.°75
KING STREET.
N 63° 30 E
PLAN
Shewing position and extent of L'Orignal lot purchased from John Gillies, Esq.
Scale 2 chains to an inch.
ROBT. HAMILTON,
Provincial Land Surveyor.

Containing by admeasurement one acre and one-half of an acre, be the same more or less, and being in all respects in accordance with the annexed plan, drawn by Robert Hamilton, Provincial Land Surveyor, and dated L'Orignal, the first day of September, A.D. 1877. Together also with a right of way from King Street to the south point of said hereby released premises through a continuation of Peter Street on the south side of King Street, such continuation of Peter Street at the north side of King Street to be on the same lines extended, and the same width from King Street to the said hereby granted and released premises ;

To have and to hold the said hereby granted and released premises unto the said party of the second part, their successors and assigns, to and for their sole and only use forever. Subject nevertheless, to the reservations, limitations, provisoes, and conditions expressed in the original grant thereof from the Crown ;

The said party of the first part, covenants with the said party of the second part, that he has the right to convey the said land to the said party of the second part, notwithstanding any Act of the said party of the first part ;

And that the said party of the second part shall have quiet possession of the said land, free from all encumbrances ;

And that the said party of the first part will execute such further assurances of the said lands as may be requisite ;

And that the said party of the first part has done no act to encumber the said land ;

And the said party of the first part releases to the said party of the second part all his claims upon the said land ;

And the said party of the third part, wife of the said party of the first part, hereby bars her dower in the said land.

In witness whereof the said parties hereto, have hereunto set their hands and seals the day and year first hereinbefore written in duplicate.

Sealed and delivered in presence of } JOHN GILLIES. [L.S.]
JAMES GILLIES. } MARY C. GILLIES. [L.S.]

Received on the day of the date of this Indenture from the said parties of the second part the sum of six hundred dollars, being the full consideration therein mentioned.

JOHN GILLIES.

Witness, JAS. GILLIES.

COUNTY OF LANARK, } I, James Gillies, of the Village of Carleton Place, in the County
To Wit : } of Lanark, Gentleman, make oath and say :

1. That I was personally present and did see the within Instrument and duplicate thereof duly signed, sealed, and executed by John Gillies and Mary C. Gillies, two of the parties thereto.

2. That the said Instrument and duplicate were executed at the village of Carleton Place.

3. That I know the said parties.

4. That I am a subscribing witness to the said Instrument and duplicate.

Sworn before me at Carleton Place, in the County of Lanark, this thirty-first day January, in the year of our Lord, 1878. } JAMES GILLIES.

JAMES POOLE,
A Commissioner for taking affidavits in B. R. etc.

[A true copy.]

Given under my hand and seal of office at L'Orignal, this 17th day of December, A.D. 1886.

JOHN HIGGINSON,
[L.S.] Registrar.

EDUCATION DEPARTMENT,
TORONTO, 20th Dec., 1886.

DEAR SIR,—Your letter of 17th instant, with enclosure is duly received, and you would further oblige by stating whether any portion of the funds for the building were raised for high school purposes, or from municipal grants for such purposes, as you observe that "the wing was intended for the accommodation of a high school."

Yours, etc.,

ALEX. MARLING,
Secretary.

EDEN P. JOHNSON, Esq.,
L'Orignal.

L'ORIGNAL, 23rd Dec., 1886.

DEAR SIR,—In reply to your letter of the 20th instant, just received, I beg to explain that the wing of the L'Orignal school building intended for the accommodation of a high school, although attached to the main building, is separate and distinct therefrom with reference to interior accommodation.

The wing has its own outside door and interior hall, and staircase, and there is no communication between the wing and main building from the inside. The wing cost about *one-third* of the whole, and that proportion, say $2,500, has been provided by our high school district which for one year after the debt was incurred, consisted of the Township of Longueuil including this village. About $600 was paid by the said township after the incorporation of this village on account of said debt, after which the township withdrew itself into a separate high school district, without duties or responsibilities respecting such a school, leaving the burden of the payment of the balance of this debt upon the reduced limit of our high school district, which is now simply the incorporated village of L'Orignal.

The cost of the public school part of the building—say $5,000—has been, and is, being entirely provided by the ratepayers of School Section No. 1, L'Orignal—only a portion of this municipality—apart from their additional annual assessment for the debt on the high school wing.

Yours very respectfully,

EDEN P. JOHNSON,

ALEX. MARLING, Esq.,
Secretary Education Department, Toronto.

L'ORIGNAL, 24th Dec., 1886.

DEAR SIR,—I omitted to mention to you in my letter of yesterday that one-half acre of the one and a half acres in the school lot was purchased on behalf of the high school, although the deed was executed for the whole lot in favour of the Public School Board.

The Protestant ratepayers petition is, of course, for a division of the front or main building alone.

Yours, etc.,

EDEN P. JOHNSON.

ALEX. MARLING, Esq.,
Secretary Education Department,
Toronto.

TORONTO, 31st Dec., 1886.

MY DEAR SIR,—The Minister desires that you proceed to L'Orignal by way of Ottawa, where Mr. Summerby will join you (as arranged) on Monday next, in order that you may together meet the Public School Board and the promoters of the proposed Protestant separate school, with the view of arranging the matters in dispute.

It is the Minister's opinion that if the school can be preserved as a public school without the secession of the Protestants it would be very much better. If it is found impracticable to bring about a fusion, it will remain to be seen what suitable and fair arrangements can be had for the proper accommodation of the proposed separate school.

Yours, etc.,

ALEX. MARLING,
Secretary.

J. J. TILLEY, Esq., Toronto.

Similar letter sent to W. J. Summerby, P. S. I. Prescott and Russell.

TORONTO, 31st December, 1886.

GENTLEMEN,—I am desired by the Minister to inform you that Messrs. Tilley and Summerby, inspectors, have been instructed to proceed to L'Orignal to meet the Public School Boord and the promoters of the Protestant separate school, with the view of arranging the matters in dispute.

Yours, etc.,

ALEX. MARLING,

Secretary.

The PUBLIC SCHOOL BOARD,
L'Orignal.

Similar letter sent to the promoters of Protestant separate school,

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TELEGRAM.

RUSSELL, 1st January, 1887.

Will meet Inspector Tilley at Windsor Hotel, Ottawa, on Monday at one o'clock.

W. J. SUMMERBY.

A. MARLING,
Secretary, Education.

L'ORIGNAL, 29th December, 1886.

SIR,—In compliance with the Ontario Act, 49 Vic. chap. 46, section 28, sub-section 14, I beg to hand you herewith a correct copy of the minutes of a first meeting of Protestant ratepayers of the village of L'Orignal, called pursuant to notice, for the purpose of appointing six trustees for the Protestant separate school of this village.

I have, etc.,

E. A. JOHNSON,
Chairman.

Hon. G. W. Ross,
Minister of Education, Toronto.

MINUTES OF A MEETING OF SUPPORTERS OF A PROTESTANT SEPARATE SCHOOL, L'ORIGNAL,

Meeting held pursuant to notice in the high school building, Wednesday, 29th December, 1886, at noon.

On motion, Mr. E. A. Johnson was appointed chairman, and Mr. C. G. O'Brian, secretary.

The chairman read the notice calling the meeting.

1. Moved by M. Millar, seconded by John Fraser, that E. A. Hall, Robert Hamilton and Mrs. Banford, are fit and proper persons to be trustees of the Protestant separate school of the village of L'Orignal, for the ensuing legal term of such appointment.—Carried.

2. Moved by John Fraser, seconded by P. H. McIntosh, that E. P. Johnson, Matthew Millar and George Gale, Esquires, are fit and proper persons to be trustees of the Protestant separate school of the village of L'Orignal, for the ensuing term of such appointment.—Carried.

E. A. JOHNSON,
Chairman.

COLIN G. O'BRIAN,
Secretary.

RUSSELL, 8th January, 1887.

SIR,—Following the instructions contained in your letter of the 31st ultimo, I met Mr. Tilley, in Ottawa, on Monday evening last, and accompanied him to L'Orignal.

The result of our mission has no doubt been communicated to the Minister by Mr. Tilley.

Below I set forth a statement of my actual travelling and hotel expenses for the trip which, I suppose, the Minister will be willing to have me repaid.

I have, etc.,

W. J. SUMMERBY,
Inspector of Public Schools.

The SECRETARY,
Education Department, Toronto.

Statement of expenses of W. J. Summerby, referred to in the above letter:

Railway fare, C. A. R., $1.25; C. P. R., $3.15	$4 40
Stage and cab fare	3 00
Hotel expenses	4 60
	$12 00

EDUCATION DEPARTMENT,
TORONTO, 12th January, 1887.

DEAR SIR,—The Minister desires me to thank you for your services in the matter of L'Orignal, and will remit the amount of your expenses.

Yours, etc.,

ALEX. MARLING,
Secretary.

W. J. SUMMERBY, Esq.,
School Inspector, Counties Prescott and Russell.

Toronto, January 10th, 1887.

Hon. Geo. W. Ross,
Minister of Education, Toronto.

Sir,--Pursuant to instruction, I visited L'Orignal in connection with Mr. Summerby, County Inspector, and have to report as follows :—

The schools of the village formerly consisted of a public school and a Roman Catholic separare school. Some twelve or fifteen years ago the separate school was discontinued, and the trustees of the public school agreed to engage a French teacher in one of the departments for the French pupils. This has been done continuously since the abolition of the separate school. As the attendance of French pupils continued to increase, the French portion of the ratepayers demanded a second French teacher, which request was not granted. Instead of this, two English teachers were employed. One of these divisions consisted almost wholly of English children and the other mainly of French, but the English language alone was spoken in these two rooms. At the election of trustees for 1886, a majority of French trustees was chosen and the principal of the school, the teacher of the senior English division soon after resigned, and another vacancy occurred in the school. The trustees then advertised for two French teachers capable of teaching both French and English. As soon as it became known to the English ratepayers that a Catholic French teacher was to be employed to teach their children, they immediately took steps to form a Protestant separate school, and during the second half of the year engaged a private teacher for their children. The separate school has been properly formed, trustees elected, and a teacher engaged for the present year. The French ratepayers are to the English ratepayers in the proportion of about two to one, and the French children to the English children about two and-a-half to one, while the assessment-roll shows that the property owned by the English ratepayers is valued at $79,515, and that by the French $41,250. In 1877 a public school building of four rooms was erected at a cost of about $7,500, and to this at the same time, was added a wing of two rooms for a high school. The cost of the latter was about $2,000. The L'Orignal High School was closed in 1874, but as the people thought it might again be opened, it was decided by the trustees to provide suitable accommodation for it when a public school building was being erected. This portion of the building has remained unoccupied till the present time, and it is very unlikely that a high school will ever again be opened there. The high school district is somewhat larger than the public school section. The latter is S. S. No. 1, Longueuil, while the former includes S. S. No. 1, and a portion of S. S. No. 2, Longueuil. The high school board has been kept in existence by the county and village councils. Debentures for the payment of the cost of the public school were issued in 1877 to run twenty years, consequently half of the debt still remains unpaid. Debentures for a similar term were also issued by the high school trustees to pay for the high school building. An acre of land was purchased by the Public School Board for their school, and when it was decided to erect a high school building in connection with the public school, an additional half acre of land was purchased by the Public School Board, and it was agreed that upon the payment of $200 or $300 by the High School Board to the Public School Board, this portion of the play-ground should become the property of the High School Board. This agreement was not put in writing, but at least four persons will make affidavit to the facts. The separate school is now taught in the high school building by permission of the High School Board and will continue to occupy this building, unless the Public School Board succeeds in preventing the High School Board from allowing their building to be used for separate school purposes. A re-union of the public and separate schools is at present entirely out of the question, but if the separate school be allowed quietly to occupy its present quarters, the time may come when present feelings have subsided and the unwisdom of the present division has become apparent, that the old lines of union may be restored, but at present it is impossible. It is undoubtedly a very great hardship that the English Protestant ratepayers must continue for ten years to pay two-thirds of the debt to which I have referred, especially as the public school building has more than sufficient accommodation for both schools. This, however, cannot well be avoided, but the hardship will be very much aggravated if the Public School

Board is obliged to erect another building. To prevent this, permission should be given to the High School Board to lease for a term of years at a nominal rental to the Public School Board, if indeed they should not be allowed to sell the property. The fact that the building has lain idle for ten years, and that the high school has remained closed for thirteen years without any attempt to re-open it, would, I think, furnish satisfactory reasons to justify the sale of the property.

All of which is respectfully submitted.

I have the honour to be,
Sir,
Your obedient servant,

J. J. TILLEY.

EDUCATION DEPARTMENT,
TORONTO, 13th January, 1887.

DEAR SIR,—The Minister desires me to state for the information of your Board that having had under consideration the question of school accommodation for the Protestant separate school, he has suggested to the High School Board that it would be greatly to the advantage of all parties concerned for the High School Trustees to secure a title to their property, as soon as possible, in order that they may have full power to lease their school buildings to the Separate School Trustees, which would appear to be a desirable arrangement.

Yours, etc.,

ALEX. MARLING,
Secretary.

E. A. HALL Esq.,
Protestant Separate School Trustee,
L'Orignal.

EDUCATION DEPARTMENT.
TORONTO, 13th January, 1887.

DEAR SIR,—The Minister has had under consideration the question of the position of the Protestant Separate School Board of L'Orignal with reference to school accommodation. He understands that their school is at present accommodated in that part of the school building erected for the purposes of a high school and under the control of the High School Board.

The Minister is of opinion that it would be greatly to the advantage of all parties concerned for the High School Trustees to secure a title of their property as soon as possible; they will then have full power to lease their school building to the Separate School Trustees.

Yours, etc.,

ALEX. MARLING.
Secretary.

Messrs. THE HIGH SCHOOL TRUSTEES,
L'Orignal,
Per E. P. Johnson.

L'ORIGNAL, 14th January, 1887.

SIR,—As required by the Ontario Act 49 Vic. Chap. 46, sec. 29, sub-sec. 13. I beg to state for your information that the L'Orignal separate school for Protestants has been legally organized, and that the following gentlemen have been duly elected as trustees for the present term, viz:—Robert Hamilton, Eden P. Johnson, Matthew Millar, E. A. Hall, Wm. Banford and George Gale, all of L'Orignal.

At a first meeting of the said Trustee Board, Robert Hamilton Esq., was appointed Chairman, E. P. Johnson, Secretary and Matthew Millar, Treasurer.

Mr. J. Howard Hay has been engaged by the Board to teach the school during the present year, and by permission attained from the Board of L'Orignal High School Trustees, our Protestant separate school will be conducted for the present in one of the rooms of the high school building.

Yours, etc.,

EDEN P. JOHNSON.
Secretary L'Orignal Protestant Separate School.

Hon. G. W. Ross,
Minister of Education, Toronto.

L'Orignal, 12th January 1887.

Sir,—Since the establishment of the Protestant separate school in the village, several of the Roman Catholic ratepayers have expressed a desire to have their properties assessed for the support of the Protestant separate school, instead of the public school, as heretofore, in order that they may be allowed to send their children to and enjoy the advantages of instruction in the Protestant school.

Have they a legal right to do so, if they wish?

Yours, etc.,

EDEN P. JOHNSON.
Secretary L'Orignal Protestant Separate School.

Hon. G. W. Ross,
Minister of Education,
Toronto.

L'Orignal, 28th January, 1887.

Hon. G. W. Ross,
Minister of Education, Toronto.

Sir,—At the request of our Board of Trustees, I wrote you on the 12th instant asking if Roman Catholic ratepayers in this village can enjoy the privilege of having their properties assessed for the support of the Protestant separate school, instead of the public school of the section, if they desire to do so. I have not yet been favoured with a reply to that letter, and as the question has been frequently asked by interested parties, you would confer a favour by making the point clear to us at your earliest convenience.

I have, etc.,

EDEN P. JOHNSON,
Secretary L'Orignal Protestant Separate School Board.

Education Department,
Toronto, 7th February, 1887.

Dear Sir,—With reference to your enquiry the Minister does not find any provision or any law which authorizes Roman Catholic ratepayers to be supporters of a Protestant separate school.

Yours, etc.,

ALEX. MARLING,
Secretary.

Mr. E. P. Johnston,
L'Orignal.

(No. 49).

Return of copies of all correspondence subsequent to the year 1882, between the Department of Public Works and any person or persons with reference to the regulation of the waters of Lakes Simcoe and Couchiching, together with the reports of the Engineer, shewing the amount expended in removing obstructions from the outlets of the lakes and also the condition in which the outlets are at the present time. (*Not printed*).

ANNUAL REPORTS

OF THE

DAIRY ASSOCIATIONS OF ONTARIO

FOR THE YEAR 1887.

I.—DAIRYMEN'S ASSOCIATION OF WESTERN ONTARIO.

II.—DAIRYMEN'S ASSOCIATION OF EASTERN ONTARIO.

III.—CREAMERIES ASSOCIATION OF ONTARIO.

Printed by Order of the Legislative Assembly.

Toronto:
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1887.

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I.—DAIRYMEN'S ASSOCIATION OF WESTERN ONTARIO.

OFFICERS FOR 1887.

President, - - - THOMAS BALLANTYNE, ESQ., M.P.P., Stratford.

1st Vice-President, - E. CASSWELL, ESQ., Ingersoll.

2nd Vice-President, - - L. CLEVERDON, ESQ., Strathroy.

Secretary, - - - C. E. CHADWICK, Ingersoll.

Treasurer, - - - J. C. HEGLER, Ingersoll.

Directors :

Division No. 7.—R. CLELAND, Listowel.

Division No. 8.—L. MCCALLUM, Stromness.

Division No. 9.—F. MALCOLM, Innerkip.

Division No. 10.—WILLIAM MESSER, Bluevale.

Division No. 11.—J. B. LANE, Dorchester Station.

Division No. 12.—WILLIAM SYMINGTON, Camlachie.

Division No. 13.—JAMES A. BLAIN, Gilford.

Auditors, - - - JOHN CRAIG, Woodstock.
J. S. PEARCE, London.

LIST OF MEMBERS

OF THE

DAIRYMEN'S ASSOCIATION OF WESTERN ONTARIO

FOR THE YEAR 1887.

Name.	Post Office.	Name.	Post Office.
Ashley, H.	Belleville.	Briggs, Geo	Sweaborg.
Alderson, Thos	Kintore.	Brown, C. J.	Ingersoll.
Allison, Wm	Rothsay.	Choate, J. M.	Cairo, Mich.
Alderson, Jas	Kintore.	Cook, Jno. W	Ingersoll.
Anderson, Wm	Woodstock.	Clark, Jas.	Embro.
Aker, A. J	St. Williams.	Cuddie, Robt	Woodstock.
Agur, Jno. W	White Oak.	Curtis, D. W	Listowell.
Bell, Geo	Bryanston.	Clark, W. K	London.
Bean, W. H	Newbridge.	Chamney, Jos	Listowel.
Ballantyne, T. J	Listowel.	Colwell, Wm	Woodstock.
Ballantyne, Thos	Stratford.	Chalmers, J	Granton.
Blake, G. H	Lyons.	Cook, G. H	Ingersoll.
Blyth, J. W	West Flamboro'.	Cleverdon, L	Strathroy.
Blough, Jas	Molesworth.	Caddy, Thos	Ingersoll.
Bothwell, Wm	Woodstock.	Dennis, Jno	Corinth.
Bain, John	Jarvis.	Dennis, C	Delaware.
Beecher, Smith	Oakland.	Dickson, Jas	Attwood.
Barry, Peter	Belmont.	Dale, Wm. G	Verchoyle.
Butler, R	Dereham Centre.		
Brady, Silas	Crampton.	Evans, Jno	Belmont.
Ballantyne, R. M	Stratford.	Eagle, H	Attercliffe Station.
Beeton, Jas	Kerwood.	Evans, Chas	Lobo.
Broadly, Jno	Gladstone.	Elliott, Jas	Tilsonburg.

List of Members.—*Continued.*

Name.	Post Office.	Name.	Post Office.
Farrington, J. L.	Burgessville.	Howard, Sam	Gorrie.
Fotheringham, Jno. W	Rothsay.	Hamilton, R	Otterville.
Facey, Robt	Harriettsville.	Hawkins, R. W.	Brownsville.
Fowler, A. M	Courtice.		
Flewelling, H	Ostrander.	Isaac, Jno. R	Crumlin.
Fulton, Jno	Brownsville.	Imrie, C. E.	Tilsonburg.
		Ireland, Jas	Ingersoll.
Galloway, Geo.	Ingersoll.	Immeo, Jno	Wellandport.
Galer, J. C. B	Ingersoll.		
Gray, J. A	Newry.	James, Jas	Nilestown.
Grieve, Thos	Wyandotte.	Johnston, Jas	Wellandport.
Gray, W. A.	St. George.	Johnston, R. N.	Springfield.
Goodhand, Geo. E	Innerkip.	James, Jno.	Tilsonburg.
Grant, Samuel	Galt.	Jolliffe, D	Thamesville.
Gray, Wm. W.	Newry.	Jenkins, C	Corinth.
Gage, Geo. M	McCurdy.	Kline, Jacob	Bismarck.
Gillard, Wm	Tavistock.	Kirtland, Alex	Milverton.
Gibson, Jos.	Ingersoll.	Kellett, Wm. J.	Kerwood.
Helmke, Henry	Brownsville.	Kerry, P.	Lucan.
Hopkins, J. E.	Brownsville.	Kelly, Thos	Norwich.
Hicks, Wm. E.	Rothsay.	Leitch, D.	Strathroy.
Hopkins, N	Evelyn.	Lane, J. B	Gladstone.
Hicks, Wm.	Dutton.	Lewis, C	Salford.
Hunter, Edward	Ingersoll.	Lyons, C.	Springfield.
Hill, C. N	Ingersoll.	Lindsay, Alex	Norwich.
Harris, Wm.	Newton.	Lea, S. R	Bookton.
Harris, Wm.	Moncton.	Leitch, Jno. A	Glencoe.
Hoover, J. M.	Springfield.	Lossee, H. S.	Norwich.
Hill, Geo.	Brantford.		
Hatch, Jno.	Woodstock.	Mills, J. H.	Thamesford.
Hayner, J. H.	Ingersoll.	Monk, L. D.	Dorchester.
Harper, Thos.	Fullarton.	Miller, Messrs.	Mt. Elgin.
Hunter, Sam	Rockton.	Morrison, Miss M	Newry.

List of Members.—*Continued.*

Name.	Post Office.	Name.	Post Office.
Mathews, E. J	Luton.	Phillips, W. K	Napier.
Matheson, H	Embro.	Perkins, J. W	Evelyn.
Mitchell, Geo. W	Strathroy.	Pelton, Alf	Innerkip.
Marr, Thos. W	Wilton Grove.	Patterson, Jas	New Durham.
Morrison, Jas	Fullarton.	Parker, A	Bismarck.
Middleton, J	Springfield.	Podmore, Jno	Ingersoll.
McLaren, Alex	Stratford.	Parrott, W. H	Cotswold.
McKellar, Jno	Ingersoll.	Robertson, Jas. W	Guelph.
McMaster, J	Ridgeway.	Rowland, H	Ingersoll.
McCook, Jos	Woodstock.	Reavely, Jas	Bookton.
McDougall, W. A	Wendigo.	Robertson, Jno	Brussells.
McKay, G. L	Villa Nova.	Ruckle, M	Lyons.
McNish, J. K	Brockville.	Reith, Jno	Blake.
McPherson, D. M	Lancaster.	Robertson, Robt	London.
McCrimmon, S	Otterville.	Riley, Chas	Ingersoll.
McTaggert, G. E	Seaforth.	Richardson, L. R	Strathroy.
McLeod, Wm. M	Thamesford.	Roadhouse, Jno	St. Mary's.
McLeod, Geo. B	Thamesford.		
McCartney, H	Brucefield.	Snell, Robt	Norwich.
McCombs, C	Kohler.	Stinhoff, I. W	Cainsville.
McAlpin, J. C	St. Anne de Prescott.	Simmons, O	Vershoyle.
Nancekville, Wm	Ingersoll.	Shragg, C	New Hamburg.
Ovens, Chas	Attwood.	Sifton, J	Strathroy.
Ostrander, Wm	Holbrooke.	Styner, J	New Hamburg.
Ostrander, C	Lyndoch.	Spiers, Adam	Caistorville.
		Snell, Stephen	Norwich.
Pulleybank, Geo	Thamesford.	Steele, Archie	Crampton.
Phelan, D	Ingersoll.	Stacey, Thos	Fullarton.
Pickard, Amos	St. Mary's.	Smith, Fred	Norwich.
Pole, Jas. R	Kerwood.	Symington, Wm	Camlachie.
Passmore, Wm	Nilestown.	Slawson, C. H	Ingersoll.
Pearce, J. S	London.	Smith, Jas	Crampton.
Pomeroy, Wm.	Fullarton.	Stewart, Chas	Flesherton.

List of Members.—*Continued.*

Name.	Post Office.	Name.	Post Office.
Talbot, Leon	Crumlin.	Whitelaw, R	Woodstock.
Trotter, Thos	Florence.	Waddel, Thos	Cullodon.
Thompson, Jas	Mt. Bridges.	White, Henry	Pine River.
Tricker, Geo	Cassell.	Williams, J. F	Cullodon.
Thompson, Wm	Arkona.	Walker, E. S	Florence.
		Wilkinson, Wm	Holbrook.
Weekes, N. P	Botany.	Walker, Geo. A	Ranleigh.
Wheaton, Jno	The Grove.	Walker, Edward	Ranleigh.
Wooliver, W	Ingersoll.	Wilford, N	Salford.
Whitely, F	Rothsay.		
Wilford, Jno	Ingersoll.	Young, Thos	Nilestown.

TENTH ANNUAL CONVENTION

OF THE

WESTERN DAIRYMEN'S ASSOCIATION.

The Tenth Annual Convention of the Dairymen's Association of Western Ontario assembled in the town hall, Ingersoll, January 12th, 1887, 2.30 p.m., the President, Mr. Thomas Ballantyne, M.P.P., in the chair.

The President, having called the Convention to order, delivered the following address :—

Gentlemen of the Dairymen's Association of Western Ontario :

It gives me much pleasure to have another opportunity of presiding at this Convention. It is not my intention at present to address you at all, much less at any length, because any remarks that I may have to make I will reserve to a subsequent session. As you will already perceive, my voice is not in the best condition to address you at any length, so that I shall not run the risk of boring you, as, probably, you sometimes think I have been in the habit of doing at some of our meetings. The attendance is not so large as we could have hoped for, the reason being that we have had a severe storm, and the roads are blocked, especially those in the north ; many trains have been cancelled, and others delayed, so that many who intended to be present have not been able to get here. It would hardly be fair to those gentlemen who have prepared papers for this convention to ask them to read them, or to expect to have discussions upon them at this meeting. It is usual on the afternoon session of the opening day to name a committee on the order of business, to make arrangements for the different speakers, to report from time to time to the convention, and to make such changes in the order of business as circumstances may render necessary. My first duty, therefore, will be to name the committee on the order of business, and I beg to nominate the following gentlemen : Messrs. John Craig, Hawkins, Casswell, Lossee, Cook, and Cleverdon. I might mention that there is a delegation here from the west, from what is probably a new dairying district in the neighbourhood of Florence, with the view of bringing before us a subject of considerable importance to all those who have to do with dairy matters. We were possibly the first association on the continent of America that employed instructors or teachers, to visit the different districts, and give lessons in particular factories, explaining not only the principles but the actual practice of dairying, and particularly of cheese-making. I know that that system was attended with the most beneficial results. It has been adopted by other associations—the Eastern Association in this province in particular, and also by associations that have been formed since that time, and especially the Scottish Dairymen's Association ; and the dairymen of Canada have had the high honour of having the instructors for the latter association selected from among the members of the Western Dairymen's Association. Those men have been employed for three or four seasons in what are now the largest dairy districts that we know of in the old country, and their efforts in that direction have been productive of the most beneficial results. One of the difficulties that has been experienced in carrying out our objects has been the difficulty of one or two individuals overtaking the work in the large district covered by our Association. We all know from personal experience or observation that in order to

effect the greatest possible improvement in our methods of dairying there must be a personal visitation of the different factories, and particularly those in the newer dairying districts; and these gentlemen to whom I have referred have come before us to see if it is not possible to have a number of branch associations for the purpose of carrying on this work. As our paternal government has always dealt very liberally, and even generously, with us, we have a revenue more than sufficient for ordinary purposes; and it will be for you to consider whether the Association should move in the direction of encouraging the formation of these different associations and employing some individuals to take superintendence over particular districts, with a view of educating the people as to the best methods for the production of milk and the manufacture of cheese. The matter is one of the greatest possible importance; and at a subsequent stage of our convention it will be proper, I think, to have it thoroughly discussed. Meanwhile, it has been suggested that the subject should be introduced to you by the gentlemen who compose the deputation, who will perhaps be able to suggest some way in which they suppose such a system could be profitably carried out. I have, therefore, great pleasure in introducing to you Mr. Cleverdon, who accompanies the delegation from the west.

BRANCH ASSOCIATIONS, Etc.

Mr. L. Cleverdon (Strathroy).—I hold in my hand a resolution which was passed at a meeting of the directors of the Florence cheese factory. Those who are interested in the smaller conventions which were held under the auspices of this Association will remember that one of these meetings was held at that place; and I am glad to be able to say that the results were of the most satisfactory character. In fact, so much did the people of that district appreciate the advantages of these conventions that the directors of the Florence cheese factory thought proper to pass the resolution to which I have referred, which reads as follows:—

> Realizing the great advantage to the dairy interests of this district that a systematic management of its affairs would give, it is moved by Joseph Childs, seconded by Archibald Bodkin, that the patrons of the Florence Cheese Factory desire to form themselves into a dairymen's association, co-operating with, and, if possible, forming a branch of the Western Dairymen's Association of the Province of Ontario.

Their object was to raise money to pay the expenses connected with the holding of these conventions, and I presume they had also in view the employment of instructors, or anything else in that way calculated to advance the dairy interests of those outlying districts. So much did we appreciate the meetings that were held, that the people are willing to put their hands in their pockets and contribute their share of the expenses; and, that being the case, it was thought advisable to try to introduce such a system in other districts as well, and with that view this resolution is submitted for your consideration. I think everyone will agree as to the advisability of advancing the dairy interests in the outside districts; and in some of those new districts it is absolutely necessary that the very best kind of instruction should be given to the patrons. I think, perhaps, the patrons require more instruction than the cheese makers; and the people there were very highly delighted with the instructions they received with regard to the raising of calves, the taking care of milk, the raising of stock and other matters of that kind. I have reason to believe that if another convention were held, and the same men were to go there that were at the previous meeting, there would not be a building large enough to hold those who would be glad to attend. That being the feeling of the people we thought it would be advantageous to enlist their support, and to get them to do what they possibly could to carry out this system. It would certainly reduce the amount that this Association would have to pay if these meetings were continued; and if you get people to act as missionaries in that way, you will get them to take a greater interest in dairy matters, and make greater improvements in all that pertains to our industry. If you give the people themselves something to do they will engage in the work more heartily and more effectively than if we forced ourselves upon them, made all the arrangements ourselves, and simply asked the people

to attend. There is one feature of this scheme which is very important, and that is to have competent cheese instructors visit outlying factories which are not doing very well. We all know that thousands of dollars are lost simply by lack of attention to what some people regard as small details connected with dairy work. By neglecting these details they fail to produce a first-class article, and the result is great loss to themselves and to the dairy industry of the country. I think if we had these instructors visiting the newer and more outlying factories, it would accomplish a very great improvement in the dairy interests of the province generally.

Mr. Trotter (Florence), another member of the deputation, spoke as follows :— There is little that I can add to what has been so clearly stated by yourself, sir, and by Mr. Cleverdon, with regard to the object we have in appearing before you. We have felt for some time the great need there was for something of this kind in our district. There have been cheese factories round us for about twenty years, but I may say that the business was so badly managed that patrons who were willing to supply the milk and to further the interests of dairying generally, became disgusted with the way in which the business was conducted and the cheese manufactured ; and the business had become such a failure that the industry, I believe, would have died out there completely but for the fact that Mr. Cleverdon came there about two years ago and took hold of the matter. Since that time the improvement has been very great. But we look forward to more progress still ; and we believe that one of the best means of effecting that progress would be by the adoption of some such plan as has been mentioned by Mr. Cleverdon.

Mr. G. S. Walker (Florence).—I have reason to know that our people have become deeply interested in the cheese industry as a result of the recent meeting which was held in our district. I could give you several practical examples of the good effects of that meeting ; and I may mention as one such example that one gentleman there has since put into practice the suggestions made at that meeting with regard to calf-raising, and he has since stated that he found it successful. Another gentleman during the last year adopted the plan of keeping systematic accounts of his business with a view of showing the actual results as to raising calves, and sending his milk to the factory. These examples show the practical benefits of these meetings, and I shall have much pleasure in using my influence in that locality to try to establish annual meetings of that kind in the interests of dairying.

Mr. Lossee.—Do I understand these gentlemen to propose to do away with the present convention ?

The President.—No, I do not so understand them.

Mr. Lossee.—I think you will find some difficulty in inducing the farmers to put their hands into their pockets and pay half the expense of an experiment of this kind, which, of course, will cost something to carry out. I think the system adopted last year, of going round and holding these meetings would probably fill the bill very well, and it is certain that a good deal of good has been done in that way. To divide up the country into five or six divisions and then hold separate conventions and pay speakers to attend them, would, I fear, almost use up all the money we have. We will probably have to apply to the Government for further aid, and the question would then be, whether the Government would be willing to lend the assistance that would be required for the holding of five or six of these conventions. The Government have heretofore been pretty liberal in granting us assistance, but I don't think it would be advisable to apply to them too often. Conventions on the other side of the water are not, I believe, assisted by the Government at all ; they must stand on their own footing. For my part, I would like to see meetings carried out similar to those of last year. If one convention were held here, another, say, at in London, and another at Listowel, and so on, other places would feel that they were equally well entitled to such conventions. As this central convention is held at different places, and as we might continue the system of holding these meetings that have been spoken of, I think that would accomplish the end we have in view, as well as any other system that could be adopted.

Mr. CHADWICK.—I am very glad to hear the remarks which have been made by the gentlemen forming the deputation, with regard to the working of these associations. We must all understand that this Association has been organized for the purpose of facilitating and advancing the dairy interests of our country, and I think all those who are conversant with its operations in years gone by, are well satisfied that it has done good work. But, on the other hand, we must go on improving; we must not be stationary. The dairy interests must be advanced by the efforts of this Association. I think the idea that has been suggested by these gentlemen from the west is a good one, and that, if adopted, it can be made useful and profitable, both to those who may connect themselves with such organizations, and to the important interest which we all have at heart. There is no question but that heretofore we have mostly failed in extending the benefits of this organization as widely as would be desirable, for the want of co-operation on the part of the patrons of factories. We have always found the greatest difficulty to be, to get those who are primarily interested in the success of the factory to attend these conventions, where they might obtain such information as would greatly improve their dairying operations and advance their interests materially. The patrons have not in that respect reciprocated the efforts made by this Association to promote their interest. Now, how can the patrons be reached most effectively? This organization has been in existence some sixteen or seventeen years. It has done good work, but we must all admit that its influence has been largely confined to the cheese-makers, and although it has done a great deal of good work, and has benefited the whole country, we must not on that account stand still. If the patrons will not come to the source from which they might obtain information that would conserve their interests, then the organization must go to them. The way to do that, I think, would be to endeavour to get those who are conversant with the manufacture of cheese to go amongst them, and how can that be better done than by establishing small organizations of the kind suggested, and get practical men to disseminate necessary information amongst the patrons of the factories. With regard to what has been said about making an inroad on the funds of the organization, I would ask, what are those funds for—what have they been granted for but to benefit the dairying interests of the country? If we have not funds enough for that purpose, we must simply make an application for more. What are the surplus funds of our country intended for but for the benefit of the country at large, and what greater interest could be subserved than that of the dairymen of this country, representing as they do, so large, important and growing an industry? If this organization feels that an increased grant is necessary for its efficiency, and if an application is made with the influence which this organization can command, I do not think any government would withstand it; I believe they would willingly grant that reasonable assistance which so important an industry may require at their hands. For I contend, as I always have contended, that the agricultural interest of the country is one of the first that should be taken into account by any government in the distribution of their surplus funds for the benefit of the people. I am quite sure, from the encouragement and assistance we have received from the government in the past, that they are willing to consider any reasonable demand for the purpose of aiding such an object. I cordially agree with the movement which has been made with a view of extending the beneficial influence of this Association by establishing organizations of the kind that has been suggested, as I believe that they would bring an immense amount of influence to bear for the improvement of those who heretofore have been most backward in availing themselves of the information which is necessary to conserve their own interests. (Applause).

Mr. CASSWELL.—Having been, with my brother directors of the Association, connected with the arrangement of those small conventions, I have much pleasure in supporting the proposition which has just been made. I think the work can be done more effectively by the method now proposed than by the one we adopted, although we considered it best at that time, and although from the interest that was shown at the places we went to, there is no doubt that the people were much pleased at having an opportunity of meeting such men as Professor Robertson and others who addressed them. I mention Mr. Robertson's name particularly, for I do not think that any man could have been appointed who could fill the position better than he did; and I believe he did more good

in going to those small conventions and meeting the people than anything else that has been done this season in connection with our work. At first some uncertainty was felt as to whether those meetings would amount to anything, because the people did not find in the notices any of those illustrious names which we have had at some conventions, but when they heard Mr. Robertson they were well satisfied, and went home better posted in dairying matters than they had been before. If this system can be continued, and good, responsible men can be sent out to these different places, a great deal of trouble and expense connected with advertising, and so on, would be saved to the parent Association, and I think that more interest would be shown in it. I do not think there will be any trouble about the funds if we can show that the work is really as important as we all believe it to be. I am sorry to say we found the least interest in the largest communities of dairymen; they appeared to have got used to conventions, and the people turned out better, and took a greater interest in the meetings held at the more remote places. I was much opposed to having this convention moving round from place to place, but I believe if you can send out Prof. Robertson and others, you will do more good than by any other plan, because you will meet those who could not be reached in any other way.

Mr. Lossee.—I would recommend that the President appoint a committee to report on this subject, as I do not think we will reach any practical result by continuing this discussion. Of course I am not opposed to these conventions if we can get them to work on the right system.

Mr. Casswell.—I will second Mr. Lossee's motion, and at the same time I would like to ask a question of him, and that is, was he not astonished to see so large an attendance at the Norwich Convention, the amount of information the people received and the good results generally?

Mr. Lossee.—The results were splendid. I think what did as much good as anything connected with those small meetings, was Prof. Robertson's addresses on the care of milk.

Mr. Casswell.—But the whole convention was a success.

Mr. Lossee.—I may say that I distributed that address among my patrons, and I could see a difference in the quality of the milk at once. The great point in cheese-making is to get the material in proper condition from the patrons, and if we could only educate dairymen and farmers to the necessity of producing a pure, wholesome milk, and of delivering it in proper condition, it would be the greatest boon that could possibly be conferred on the cheese-making interest.

The President.—Mr. Lossee has suggested the appointment of a committee to consider this question. It is perfectly true, as these gentlemen have stated, that those meetings are productive of a great deal of good. It is not possible to have meetings of that kind attended by farmers and dairymen, and conducted in the proper way, without their resulting in improvement both in the quantity and the quality of the milk supplied. But we find that during the season we require something more than merely holding meetings, and that is, some kind of superintendence, and the more efficient it is the better. I am perfectly satisfied that we will never succeed in making perfect goods until there is some way of reaching the patrons. Though speeches and written instructions do a certain amount of good, there are certain cases which they do not meet. These cases can only be met by actually showing the patrons how to manage their milk, and by afterwards seeing that these instructions are carried out; for you need not flatter yourselves that all patrons are so scrupulously honest that they never take any cream in their coffee, or never go near to the well. One reason why our goods are not perfect is just the existence of this class of cases. As I understand from the gentlemen who have addressed us, their idea is that there should be branch associations, covering a certain number of factories, and getting a small amount of assistance from the parent association, and that, even if we cannot raise all the funds ourselves, we should apply to the provincial government, who, I am satisfied, if they see a good case, will not refuse their assistance. I am quite satisfied that the high standard of quality which we should look for will never be fully attained, either by our meetings or by printed instructions; it can only be attained by close personal watch-

fulness. I have noticed that, although you will always be able to get an opportunity of talking to your patrons at the annual meeting, especially when you make it a rule when settling your business for the previous year, and although they may listen to you and think they understand your instructions, they do not, as a matter of fact, apply them in their work; so that I have made it a rule to have the cheese-maker go around among them. It may not be every cheese-maker who is sufficiently acquainted with the people, or who has had enough experience to have the proper influence with the patrons, but if a man had the superintendence of say twenty factories, they would soon learn to respect and obey his instructions. You will never get perfect goods until you have perfect milk, and that you will not have unless you make it a rule to look closely after it, and have the greatest care exercised at every step of the work. One of the most discouraging things connected with cheese-making, as everyone knows who is acquainted with the history of dairying in this country, is that while you are trying your very best to improve the quality of the cheese by the expenditure of both time and money, the object of the patrons appears to be to study and plan how they can get a cheese-maker for a few dollars less than they paid the year before. The effect of this is that a factory advertises for a new cheese-maker, thinking they will effect a little saving; a young man is appointed to whom the people are all strangers; he has not that amount of influence over them which is necessary, and the result is that they are apt to become careless, the quality of the milk is not right, he does not know the names of those patrons who are not up to the proper standard as regards the quality of their milk, and it is often impossible to detect the results of their carelessness when the milk arrives at the factory. He keeps fighting away; he thinks his cheese is pretty good, just because he does not compare it with the high standard he should have in view, but compares himself by himself, and the consequence is an inferior article, and loss to all concerned. Supposing, on the other hand, you have twenty factories, with a man over them who has had seven or eight years' experience, who knows how the milk should be taken care of, who knows which of the patrons are scrupulously careful and honest and which are not, the result is that matters are kept in proper order, and a high standard of cheese is produced. I know that I have, to some extent, departed from the question really before us; but my reason is that I feel that I cannot emphasize too strongly the evil effects of this determination on the part of some patrons to get their cheese-makers for almost nothing. If you reduce your cheese-maker's wages to those of an ordinary unskilled labourer, you prevent young men of intelligence and skill from going into the business, and I maintain that there is nothing that requires a higher order of intelligence than the business of making a high quality of cheese. If this process of getting cheap men to make your cheese continues for a few years, it will have the effect of driving out capable and intelligent men, and will have a most serious effect in deteriorating the high quality of Canadian cheese. The mechanic in a foundry, you may say, always finds his iron in the same condition; his tools are always the same; his methods are pretty much the same; but with the maker of cheese it is entirely different. As we all know, there are hardly two days on which he finds his raw material in the same condition, and yet he has to use his agents, the rennet, the heat, the acid and the salt, to produce a uniform quality of goods from a raw material which is constantly varying. We require the best class of men for the work; and the best men we have to-day are those whose observations have extended over twenty or thirty factories, rather than those who have continued manufacturing in one, thus having no opportunity of seeing any but their own goods. This is a matter which I have thought a good deal about for many years, and I remember remarking at one of our conventions some time ago, that improvement in this direction should be one of our next steps, though I did not see very well how it was to be accomplished. If, however, the people are sufficiently alive to the importance of the matter to form local associations, dividing this end of the province in districts, and apportioning a certain sum of money, according to their contributions—like the school grant, or the township agricultural grants—and if a competent man were engaged to spend his time during the season in looking closely after the actual work of milk production, it would be something which, I think, would lead to the very best results. I am glad this matter has been brought before us, although the discussion has come up this afternoon, when the attendance is thinner than it is likely to be at our subsequent meetings.

Mr. W. D. Hoard (Fort Atkinson, Wisconsin)—Mr. President, and Gentlemen: I do not think that human nature, from what I have heard to-day, is very much different in Canada from what it is in Wisconsin. The great, ever-present, universal need and hunger of the dairy interest in Wisconsin—and I believe in Canada as well—is how to reach the man that makes the milk. He is a problem; he is an unknown quantity; he is a personal equation; he is a puzzle. The whole of our missionary effort must be directed to this tremendous mountain that Mahomet must finally approach, for it is impossible to get the mountain to go to Mahomet. The great question in our dairy work in Wisconsin—and I can do no better than compare personal experiences in this particular with you—has been this matter of personal education. As a rule, the farmer shuts himself up away from knowledge as he would from the small-pox. (Laughter). He thinks it is catching; he is not at all certain but what it will carry him off and land him in a premature grave, and as a result he eyes it with suspicion. (Laughter). Having never been inoculated, he knows that taking it in a natural way will erect a tremendous pustule. (Laughter). As a consequence of this fear of knowledge on his part, you do not know what to do with him. The great difficulty with us has been this misapprehension of the kindly effects of knowledge on the part of the farmer, and when and how to overcome it. We have been wrestling with this problem in Wisconsin and have solved it to a certain extent. We inaugurated last winter a series of farmers' institutes, under an appropriation from the legislature of $5,000 annually. This money was placed in the hands of the regents of the state university, and they appointed a commissioner or superintendent, who arranged and carried out the programme, and got the speakers; and we had thirty institutes in thirty counties last winter. The stimulus imparted by those institutes, in creating hunger in the people for knowledge, their awakening to the fact that here was a domain which they needed to enter, was very encouraging indeed, and gladdened our hearts universally. This winter we have fifty institutes; we have had your own Prof. Brown and a number of other leading men from various portions of the west and we hope we shall have more of them. The meetings were wonderfully well attended. A great interest has been created in dairy matters; we are reaching the people; we are getting them to read and think and study for themselves. It was noted last summer that wherever an institute had been held amongst the farmers in dairying districts there was a marked improvement in the character of the milk. Let me give you a case in point, and I was very pleased to hear the president speak with regard to this question of the quality and condition of the milk. The condensing factories at Elgin take a large proportion of the milk produced in that section. Those who supply the milk have to submit to an inspection, not only of the milk but of their premises. The inspector can visit them at any time; they know not when to look for him, and when he comes he looks over their stables, looks into the quality of their water, the condition of their feed—in fact he inspects them thoroughly with regard to all the appurtenances of dairying. What is the result? The milk for condensing purposes must be very pure—so pure that there will not be any danger of its subsequent ferment in a condensed form. Now under those very simple arrangements the farmers that supply the milk to the condensing factories have grown in knowledge. It is like the criticism of the market on the man who sends a package of butter to New York; the market is fearless with him and tells him his faults. Probably he gets his back up; but he is allowed to have all the time he wants to take it down again (laughter); and if he does not want to get on the loaded wagon and ride, why he can go afoot (laughter). By-and-by he comes up to full stature in knowledge. We have been trying another system, and that is the stimulating of the owners of the several factories in the winter interim to hold meetings of their patrons, say twice or three times during the winter, and among themselves in an intelligent way discuss these questions. We are coming to another question very rapidly in Wisconsin, and one that I believe lies underneath the whole matter. Our factory system is commercially false and wrong. We carry on this system of pooling the milk without sufficient reference to its specific value. What shall we do? The oil test is coming to the front, and we are about organizing some factories on that very basis; we take the oil test as indicative of the general value of the milk; we know that it holds good in almost every case; and if a man's milk does not come up to the oil

test, he is subjected to a loss, and when you touch his pocket nerve it is astonishing how quickly you reach his intellect. Sooner or later you must come to this question of a division of the profits according to value; and I think when we do we shall have reached the root of this matter; and we shall then have reached a larger and quicker return in the intelligence of the patron. We are getting our patrons in Wisconsin to read more and study more, to think more upon the feed question, upon the proper milk ration, upon the care of the cow, and to think more and with a more discerning understanding as to the nature of the dairy cow. We have made great advances in two years in that study, and I think, under the circumstances, our conditions are very much like yours, except this, that you do make a better cheese than we do. We have factories which make as good a cheese as the Canadian factories make, but alas they are all too few. We have also taken a good deal of encouragement from your efforts in this matter; and I think if we could more completely mingle our experience on these different questions one with another we would aid each other very materially. But, gentlemen, the men you should reach are not here; they are not at these meetings; they never will attend them; and so long as you live, though you may hold your meetings under the most favourable auspices, and bring the most commanding talent, these men will not attend. The mountain will not come to Mahomet, so you must organize in some way so that Mahomet shall go to the mountain. (Applause).

Mr. John Craig (Woodstock)—I have been asked to say a word or two on this subject; but it has been so fully and ably discussed that it is scarcely worth while for me to say more. Convention after convention we have taken occasion from this platform and others to point out the great difficulty we have in reaching the men whom we wish to educate as to the proper feeding and care of cows and the production and care of milk. As the last speaker has well said, these men form a class that we fail to reach, and he adds that we will never reach them under the present system. Past experience at our conventions shows that more and more every year they are being attended by young men seeking for information as to how to conduct factories, but seeking for it in a very general way. The remarks which have been made by our president, as well as by the gentleman from Wisconsin, with regard to the necessity for inspection, struck me very forcibly. It would, no doubt, be a very great gain if our associations covered a narrower area and more conventions were held, as thereby the patrons of the factories would not have such a distance to travel as they now have. For instance, these gentlemen who have come here to-day from Florence would go to that place; others would go to Ingersoll or Listowel, so that thus far our object would be served; and as has already been stated, that could be done without much expense. It was done last year, and according to the statements of those conversant with the matter, the meetings thus far held have been successful. But at the same time to have the matter thoroughly brought to an issue, and to have the patrons fully alive to the vital importance of attending to the purity of their milk, there must be a system of inspection by which they shall be stirred up and stimulated to greater and more constant care in this matter. Reference has been made by the gentleman from Wisconsin to the particular care which is exercised by the managers of the milk condensing factories. When I was in New York state several years ago there came under my attention the scrupulous cleanliness and care which was exercised there, so that not a speck of anything which was deleterious should be found in any of the vessels used in the whole process, by those who brought their milk to the condensing factories. The best appliances were also used to ensure that care and cleanliness, so that there should be nothing of a putrefactive nature in the condensed milk, which would have the effect of destroying its good qualities. It is essential, as has already been said, to have pure sweet milk in order to manufacture first-class cheese, and just as essential to have it for that purpose as for the purpose of making a good condensed milk for exportation. It is just as impossible to make good cheese from impure milk as it would be to have a condensed milk which would be marketable if an impure article were used; and hence the necessity of having these inspectors for the purpose of stirring up and instructing from time to time those patrons who send their milk to the factories. It may be said such a system would be an infringement on the liberties of the patrons. They would very likely say "We are not going to be looked upon as frauds; we are not going to be

subjected to the enquiring eyes of an inquisitor going around examining our farms, our barn yards, our fields and our water supply. We live under British law, and we will not be annoyed by these things." But we must bear in mind that true liberty has its limits, and that the liberty of one individual does not give him the right to ride triumphantly over the general community. I say that the general good of the dairy interest of Canada requires that there should be established a close and rigid inspection of the milk before it is sent to the factories; and that as soon as possible we should endeavour to secure such a system. Reference has been made again to-day by various speakers, including our friend the president, who has lately been returned again as a member of Parliament—and long may he be so—to the probability of our paternal Government doling us out more assistance if we could present to them a good claim for additional aid. For my part, time after time I have said all I could say against this system of dairymen's associations and agricultural associations sucking public pap in that way. Why should not we ourselves use the best means in our power to make an article which will secure us a better price, and thereby recoup us for our extra expense in making it, without these constant appeals for public help? So common has this practice become of applying to the provincial or the Dominion legislature, so dependent have we become on government aid, that I notice that they are actually asking that the little busy bee shall be subsidized—the busy bee which the poet Watts described in these words:

How doth the little busy bee,
Improve each shining hour,
And gather honey all the day,
From every opening flower.

(Laughter and applause.)

I think this thing is going too far, and that the sooner we, as a body of intelligent men, depend upon our own energetic work in perfecting our methods and appliances so that we may manufacture an article which will command the markets of both America and Europe, the better it will be for us, instead of attempting to do it by these constant appeals for legislative assistance. (Applause.)

Mr. W. D. Hoard—I just want to relate one incident in connection with this subject, which may serve as an illustration. I was sent for one time to inspect a cheese factory. Difficulty had arisen between the patrons and the maker, and it was thought that I could throw a little oil on the troubled waters. The milk was bad, the cheese was bad; everything was bad; and I spent three days in that factory, watching closely each batch of milk as it came in and inspecting it with all the judgment I had as a cheese-maker. I came to one batch of about 800 pounds which was simply foul. Instantly I detected it. I asked the cheese-maker, "What have you been doing with this milk? Have you been taking it long?" With a shrug of the shoulders that indicated that the man was a coward, and did not dare to have the courage of his convictions, he said "Yes." I said "Why have you taken it; that milk is foul; it is bad milk." I told him to put it in a vat by itself. He did so, but he gave me no really substantial answer as to why he took it. The fact was that the patron was an influential man. The result was that he went on and made the cheese for that day without that milk, and we had no difficulty at all. The curd came all right; everything worked well, and we got along nicely; but this milk went into a ferment in a very short time. When the patron brought the milk the next morning—and it was foul the same way—I called his attention to it, and told him to look at his milk. He was one of those stiff-backed, cranky fellows. He flew into a rage, and said that his milk was as good as any man's. I said "Here, have you got a good nose: smell this milk, and smell this other milk, and tell me if you can find any difference." He said "No, he could not;" his self-interest stopped his nose in a minute. Finally it came to this point, that I went out to his farm, as I did not like to have them refuse his milk without any opportunity of instructing him. I went out with him to the farm, and I was as patient and as kindly with him as I knew how to be. I said "Your milk is bad; it is foul and wrong. Let us look over your conditions. I suspect very clearly from the character of the milk that the cows are drinking bad water," for in nine cases out of ten that is the origin of bad milk.

The President—That is my experience.

Mr. Hoard—I found that his sole water-supply was a sort of sink-hole, where the cows stood day after day, and that the droppings and the urine and everything else went into the water, found its way into the milk, and this was the cause of the whole mischief. Well, I succeeded in convincing him what the trouble was. I took a microscope, and placed some of this milk on the slide, and showed him the character of the organisms that were in the milk. I then took some of the water, and showed that the organisms in it were almost absolutely identical with those in the milk. I showed how this element of fermentation was conveyed from the water to the milk, and I finally did get the idea into that man's thick head; and when I succeeded in doing so he reformed the whole business. I discovered then that the trouble was lack of knowledge and understanding. He thought that any kind of drink would do for cows; and when I told him the water was foul he said "I don't believe it; you can see the cows drink that water; they like it." I said "True, and I have seen you drink bad whiskey and like it, but that did not prove that it was good for you, any more than this proved that the water was good for the cows." I believe that if we could get at the water-supply and effect a reform in that direction we would often save very costly experience. (Applause.)

Mr. Gordon Cook—I do not know that I have anything to add to what has already been said. I heartily concur in the remarks that have been made as to the necessity of reaching the patrons. I know that there is very great difficulty in getting pure milk, and if we could devise some means of instructing the great mass of our patrons in that point, we would see a decided improvement in our work. I am a little at a loss to understand how Mr. Cleverdon proposes to bring his plan about. Does he propose to organize certain districts into associations or conventions, and manage them something in the way that the district agricultural societies are managed? If that could be done, I think the plan would be very successful. I am sure that we do not want to do away with the parent association, but if we have these tributary conventions I think they would be a great source of benefit. I am sure the government of the day will be willing to appropriate a further sum of money to such a purpose, for they would no doubt see the benefit it would produce in a short time upon the dairy interests of the province.

Mr. Lossee—I think we should petition the Government to have a milk inspector go round among the various factories, and when he found milk that was not suitable for human food, he should have the power of rejecting it and perhaps of imposing some penalty besides. We have inspectors of different kinds who are doing a work which I believe is not nearly so beneficial as the work which might be performed by an inspector of milk. I believe every factory takes in milk that is not fit for human food, and the quality of the whole product is thereby injured.

The President—I may say that since the last speaker sat down Prof. Robertson has arrived and we will have an opportunity of hearing his views on this important subject. My friend, Mr. Craig, is possibly a little extreme in his voluntaryism, though there is no doubt it is the correct principle. If you bring up a child with the idea of receiving eleemosynary support, he will be very apt to grow up with the notion that he should not do anything for himself. If our own efforts are insufficient, I think we might very properly get a little aid from the provincial government, but we should not depend too much on such assistance. I have no doubt, however, that it would have been impossible for us to have kept the association going, and do the work which it has done for the dairy interests of the province without the provincial grants which we have been receiving. On the other hand, I may say that I have been connected with the Association since its formation, and have attended every one of these meetings except one, when I was prevented by illness, and I know that in the early days of its history, if it had not been for the enterprise and energy of a few public spirited individuals it would have died long ago. I have now the pleasure of introducing Prof. Robertson.

Prof. J. W. Robertson (Guelph).—I feel somewhat at a loss in discussing this matter before the convention this afternoon, inasmuch as I arrived so late that I had not the opportunity of hearing the other speakers who have addressed you on the subject. As far as I gathered from the remarks of our president, I believe that the question before you

is that of forming district associations. I quite agree with all that has been said concerning the advantages which might accrue to the dairy industry by the establishment of such associations, but I do not think these would be of much service unless they were controlled by a central organization like this. In other words, while I believe in the distribution of agencies for accomplishing a good work, I think their multiplication without a system of supervision and centralization would be an element of weakness rather than strength. I quite believe that this Association might apply its forces to educational work in the dairy industry to more advantage through district associations forming a part of this central body ; but if you have these district associations working independently of this Association, you would be likely to have friction and opposition; you would have contrary interests continually at work, and you would have a confusion which would not be a source of strength to our educational efforts. I think it is best that we first consider this Association as the organization to which we must look for further instruction in regard to dairy matters ; and if this Association could appoint a number of inspectors or instructors, and have them under the care of a committee, responsible to, and appointed by this Association, I think it would be a move in the right direction. A still better plan would be to have these instructors under the direction of, and responsible to the dairy department at the Ontario Agricultural College. If however, you had a London district, and a Listowel district, and a Stratford district, each with its own association, acting independently of this body, there would be something more than afriendly rivalry ; in fact, I fear it would result in an unfriendly rivalry between them, which would not lead to improvement in the dairying industry. I think it would be an advantage for an association like this to concentrate its powers in the direction of instructing the more backward districts in matters pertaining to the manufacture of dairy products. I might say that the Eastern Association has taken some action looking in this direction. At their meeting held at Brockville last week they proposed to appoint some half dozen instructors or inspectors for the whole section east of Toronto. They proposed to systematize the work of these instructors by combining in one person the work of supervising and directing the inspection and instruction. It was suggested that they should report weekly to the dairy department of the Ontario Agricultural College at Guelph ; that instruction should be given them monthly at meetings held for that purpose, and that they should report as to their work from time to time to the central office. Personally, I had nothing whatever to do or to say with reference to the suggestion regarding the college ; but I certainly think that unless you have the work systematized in some way, with a head to direct it, the work itself will not be so well performed. I think, perhaps. it would be well that no action should be taken until the delegates appointed by the Eastern Association to this convention have been consulted, when a line of conduct satisfactory to both organizations may be agreed upon. I find that in certain localities there is much need of this work of instruction. Some localities have uniformly fine goods, while in others there may be one good factory producing an excellent quality of cheese, while others produce an inferior quality. When I was in London, England, this fall, I found that the great cause of loss to the Canadian dairymen was that while we had some goods of fine quality there was still some inferior cheese. It therefore behooves the Association to direct its energies towards bringing up the standard in the weaker factories, rather than seeking to make an improvement in the quality quality of the cheese produced at the best factories. I think we know enough of cheese making to make cheese quite equal to the demands of any market. The trouble with us is that the inferior goods produced by the more backward factories impair the value of our total export. If a system of inspection were adopted and enforced so that the factories would be subject to a visit from this officer at any time, I think we would at once notice a great improvement in the quality of the make. I am strongly of opinion, however, that such a system as the one proposed could be best instituted through this Association and its officers and members, without the necessity of multiplying machinery. If you organize separate associations, each would have to have its president, its vice-president, treasurer, and so on, which would mean a greater outlay for salaries and other expenditures. The funds would be swallowed up to a large extent outside of the immediate practical object in view, whereas with this Association as the central body, superintend-

ing these instructions and directing the efforts of the men who might be employed, I believe the very best results would be accomplished. (Applause).

The PRESIDENT.—If it is the wish of the Convention that I should name a committee, I will proceed to do so, and when they report we will have an opportunity for a further discussion of the matter. I would appoint as a committee the following gentlemen: Mr. D. Leitch, Mr. J. B. Lane, Mr. Facey, Prof. Robertson, Mr. Casswell and Mr. Cleverdon. Is there any other question which you wish to bring up, for, if not, we had perhaps better adjourn until the evening session, when the attendance will be larger.

Mr. HAWKINS (Brownsville).—While I would not advocate branch associations scattered here and there, I believe that meetings held among the different factories would be productive of a great deal of good. Last winter's meetings were very successful. It was remarked at first that we would not be able to get people to come out, because we had no prominent men advertised to attend them; but my opinion is that we could get people to come out better and take more part in the discussions and draw out more information when we do not over-awe them by having a number of prominent men on the platform. At the meeting at Brownsville we had Prof. Robertson, Mr. Casswell, and others, and as we know them all pretty well we did not feel afraid to question them. We had confidence in their ability to answer our questions to our satisfaction, and even if we opposed them we felt at liberty to do so without danger of having the wind knocked out of us. (Laughter). I believe that a great amount of good would be accomplished if more of those meetings were held. I believe that the trouble among the patrons is not so much from actual or deliberate carelessness as from a want of knowledge, and if we could get them to come out to the meetings and take part in the discussions and question the speakers on practical points connected with their work, I believe the result would be very satisfactory. I do not think that the organization of new associations, each with its own set of standing officers, would be productive of nearly so much good as meetings held under the auspices of this Association. For my own part, I know that I received instruction at the Brownsville meeting last winter which amply repaid me for attending; and in saying so I believe I speak the mind of at least fifty patrons of our factory who attended that meeting.

Mr. W. H. LYNCH (Danville, Que).—Though what I am about to say may have the appearance of fault finding, I do not say it in any fault finding spirit. I attended the Eastern Association meeting at Brockville this year and that meeting was characterized by something which I thought was productive of the very best results, and that was the spontaneous, ready, active discussions on the various papers which were read, by those who formed the body of the audience. Though we have had splendid conventions here I must say that in this one respect it appears to me that the Eastern Association bears off the palm. I think instead of calling to the platform every member who wishes to ask a question or make a remark, it would be better to allow him to speak from the body of the hall, as in that way members will feel freer to engage in these discussions which prove so useful a part of our proceedings.

The PRESIDENT.—I am fully aware that a great many members who would speak from the body of the hall would be unwilling to come to the platform, but I may say that my request to have them come forward to the platform was on account of the difficulty of the reporter hearing remarks which are made in the body of the hall. We must remember that it is important that these discussions should be recorded for our report; and it was solely on that account that I made the request. I may say that, as the audience has now considerably increased, and as it would be a great pity to adjourn so soon, I will introduce to you Mr. Hoard, of Fort Atkinson, Wisconsin, who will address you again for a short time on the subject of Winter Dairying.

WINTER DAIRYING.

Mr. HOARD.—This question of Winter Dairying is an absorbing one, and probably I could not do better than in a simple manner state our experience in that kind of dairying. In the town of Fort Atkinson, Wisconsin, we have a large separator creamery, which is being run at the present time with my son as its manager. I have a strong personal interest in the creamery myself you see. We are receiving daily about 6,000 pounds of milk, and we have created this large industry in about two years. There was no creamery in existence in that town until last spring, although an attempt had been made to establish one the year before. The patrons are composed of a very fine class of butter makers, who have for ten years made their butter and shipped it to almost every market in the United States—to New Orleans, Pensacola, Philadelphia, Boston, New York, Chicago, Pittsburgh, Buffalo and other places. Fifteen years ago we had in Jefferson county not a single man who made his butter and shipped it to the butter markets; it was all sold at the country cross-roads store. I took hold of the matter and strove to work a revolution, and I finally succeeded, knowing the excellent effects of market contact upon the judgment and intelligence of the producer. The market that they had been selling to was not a market at all. Mrs. A got just the same price for her butter as Mrs. B, even although her butter was worth 10 cents a pound more. The local merchant dared not jeopardize his interests with Mrs. B by making any distinction in her butter. He paid her the same price as Mrs A, and what he lost on the butter he made up by charging her more for the calico he sold her. The result of our efforts is that we have now 1,500 butter-makers who pay no attention to the local demand, but consign their butter to the commission men and receive their money. Before that we had been sending ducks to the mutton market; but now we are sending the article to the proper market. By coming in contact with the market there was a rapid improvement in the judgment of our farmers, and it also gave them a desire to understand their work and how to keep thoroughly posted upon it. It has led largely to the introduction of winter dairying amongst these people. It soon became evident to the farmer that it was a back-handed business for him to make milk when the milk was the cheapest, and allow his cows to go dry when the milk was the dearest. As a result they confronted that proposition; they began to study the problem carefully and slowly, because they are a conservative class of people. By and by they began to reach out for information; and as a result of their study the pioneers in the business of winter dairying in that part of the country have been prosperous and are dotted here and there over our county. I took occasion to lay before them a practical statement as to the cost of producing winter milk over the cost of producing summer milk, and the relative difference in the profits of the two systems. I believe that when we shall have reached a proper understanding of our environment, so that we may control our circumstances, we will yet make our cheese very largely in this way. That, however, is a matter of conjecture, but as regards butter we know that it is entirely practical. I found that it cost from 10 to 15 per cent. more to make winter milk than to make summer milk—on the understanding that the man kept his cows in the winter as he ought to keep them for good summer use; and I found that the return upon the milk in winter was 30 per cent. greater than in summer. Now, you have before you a proposition in figures which you can readily understand and digest. We then for the first time commenced to confront the question of the cost of production. As long as a man can go through with simply an unconscious sense of ownership, knowing that he has so many acres of land and so many cows to graze upon it, or so many acres of crop, he goes on and pays his taxes in a semi-comatose condition, and in fact conducts all his operations by a system of unconscious guessing; he guesses that it costs about so and so, but he does not know. But when he is brought face to face with the question of just how much a cow eats; what she costs to house and care for, it then becomes a commercial proposition, and he must be a dull man indeed who cannot see through the problem if he confronts it in that way. So we have been following up this new problem of the cost of production, and we have accomplished some very important results. We reduced the cost of production marvellously in two years. When we can take, for instance—and

we are more favourably situated than you are, because we have a fine corn producing section—when we can take an acre of corn fodder, and make it produce from eight to sixteen tons of cured fodder, and put it in and cultivate it and cut it and house it at a cost not to exceed $2 a ton, we have proceeded a considerable distance in the solution of that economic proposition which is the secret of success in the production of milk. We are paying to-day in our creamery $1.15 per hundred for the milk, and we are returning eighty per cent. of the skimmed milk to the patrons. Skimmed milk is worth 25 cents a hundred when pork is worth $4 a hundred; rightly handled, it is worth 25 cents a hundred as a pork feed. We have demonstrated this by a series of exhaustive experiments, conducted not only in the Wisconsin Experimental Station, but by myself and several other private individuals. As feed to the calves we find it worth from 30 to 35 cents a hundred, and in exceptional cases we have known it to be worth 46 cents a hundred. For instance, I took a short-horn calf weighing ninety pounds when dropped; I fed him skimmed milk for four months; he never saw a particle of new milk after the ninth milking. I fed him thirty pounds a day for four months with one dollar's worth of oatmeal, and eighty cents worth of linseed. I fed him three times a day, the feed warmed to eighty degrees; and he weighed 420 pounds when he was four months old, and was sold for $28. In that case he consumed 4,300 pounds of milk, and it was worth 46 cents a hundred. Allowing the calf to be worth $2, which is the amount the butcher would have paid when he was three or four days old, allowing $5 for the trouble of feeding him, and adding the cost of material used for feed, it left the cost of production at a little less than $20. This, however, I should mention, is an exceptional case, and should not be given as an average result. But, as I have said, we are paying for this milk $1.15 a hundred, and returning eighty per cent. of the skimmed milk to the patrons. Now, when a man asks me what this milk is worth, he has then struck this personal equation which is so difficult to adjust and understand. I may say that we find a vast difference in the ability of the farmer to grasp a straight proposition of that kind, until we get him to enter into exact calculation and study of each item of the cost and proceeds. Take skimmed milk, for instance; it is the hardest work I have ever had in my life to upset the notion that the baby calf—the baby bovine—should not have sour food. It is the hardest work in the world to prevent a man from giving his pigs sour feed. These inbred notions that we have on the subject of feeding are the hardest things in the world to extirpate. I do not know the reason why they are so difficult to eradicate, except that it shows us the powerful nature of heredity, but to make this principle of heredity useful to us we must take advantage of it. When we get it into our minds that this calf is a baby, how that opens up the delicate perceptions we have on the subject of babyhood! He is a baby; and realizing that, how easily we come to understand that he should be treated like a baby. Just in proportion as we understand the baby instinct and the baby stomach can we see what to do. We start, for instance, with the rennet stomach, delicate as possible, refusing to take solids except in a certain form, and for four weeks we have to deal with that kind of stomach and that kind of digestion. Then we pass along gradually until we come to what is called the ruminating stomach. Did you ever see a calf the first time he raised his cud? It is an epoch in his life—a revolution in his history—or at any rate it is a revelation to him. (Laughter). Now, let us take three propositions and look at them, and we need never go astray. We have to adhere to that order of nature which his own mother adheres to when she gives him food. How does she give him his food? First, she gives it to him warm; second, she gives it to him sweet; and third, she gives it to him often. An ordinary calf, according to my observation, running with his mother, will suck from twelve to twenty times a day; and the result is that, though he is satisfied, he never gorges, and he has always an easy stomach and a free digestion. Now, what do you do? Probably the calf has good luck with some men if he is fed twice, and the result is that he has got a belly on him like an American dollar (laughter); he is pot-bellied, dyspeptic and unhealthy. His digestion is bad, his stomach is sour, and each hair on his body stands out in everlasting and indignant protest against the folly of such feeding. (Laughter). Why should the farmer forget the instructions of nature? Why should he? The Lord only knows, and he wont tell. (Laughter). But there is something to me very strange in the fact that the man who lies down close by nature and lives by it, should

have such a contempt for it. It is bred into him, that is the trouble; "it don't pay to do this," and "it don't pay to do that, and the other thing," and it "don't pay" is the cry all the time. This is the cry I have heard so often that sometimes I think that the American farmer has got into a state of negative dry rot, where he has none of that enthusiasm and positive conviction, that it does pay to do the right thing and to do the right thing at the right time. Now, if the calf takes his food often from his mother, if nature gives it in that way, why should not you do the same thing? Then the mother always gives it to him warm; she is a dead cow if she doesn't (laughter); and third, she always gives it to him sweet. Reflect for one moment on the constituent character and quality of milk. Take unskimmed milk, and run it through a separator, and you take four pounds of butter out of the hundred; you have eighty-seven pounds of water and thirteen of solids on the average, and taking out the four pounds of butter fat, we have nine pounds left, and nearly five pounds of it is milk sugar. Of course, the chemists do not yet agree in calling it sugar, but for convenience sake we do. It is sweet, but so is arsenic; so that that does not make it a sugar. But it has a most powerful effect in the promotion of young growth, providing you save it; but the moment the oxygen unites with the milk sugar and produces lactic acid, it is gone. Lactic acid has nothing but a medicinal effect. It is true, it is anti-febrile, and if you have a feverish calf it is good medicine for him; but you have lost five out of nine parts of its value as a food. Now, why should not we take a little pains to save the major portion of its value? In the separator creamery we have a very easy way of doing it; some men have a prejudice against separator milk through a misunderstanding of its nature. As the milk comes from the separator we pass it over a series of beer coolers—a series of pipes like a steam heater; these pipes have ice water through them, and the milk is cooled down to forty-five degrees as soon as it comes from the separator, for if not it soon becomes sour, because it has been heated to eighty degrees in order to run it through the separator. Now, if farmers will take that milk—and I may say that we have great difficulty in convincing the farmers of the necessity of keeping it cool—if they will take it home and provide themselves with cheap conveniences for keeping it cool, and then warm it up as they feed it to the calves, they will find it a very fine article of food. This season I saw one man with a herd of thirty cows who raised 24 calves that are as fine as you can find in this Dominion; and he raised them with no further expense than the skimmed milk and about $1 worth of oatmeal, fed in the form of a kind of porridge, and about 80 cents worth of linseed oil meal.

The PRESIDENT.—Do you cook the oatmeal and the linseed oil meal?

Mr. HOARD.—Yes; both are cooked at first, until the calf is six or eight weeks old, and then the oatmeal is fed dry. If you take the young calf with its tender stomach, a calf six or seven days old, you need to sift the hulls from the oats and make this feed in the form of a porridge, and continue this until its stomach gets into the habit of taking the stronger food. In feeding the calves you should notice the condition of the calf's nose, the condition of his hair and the condition of his excrement, and with those guides you should not go very far wrong. Those calves that I have mentioned were dropped about the 1st of April, and the twenty-four of them could be sold to-day easily for from $16 to $18 apiece, and the man who buys them will make more money a good deal than the man that sells them.

The PRESIDENT.—Perhaps you will be kind enough to explain the signs you have mentioned as to the condition of calves.

Mr. HOARD.—If the calf's nose does not show a natural colour, and if it is not moist, it is a sign that he is not in right condition. The moment it begins to feel dry and to have a sort of greyish colour it is an indication that the circulation is bad and is retiring from the extremities. That condition, as a rule, is caused by dyspepsia. The excrements should have a clear, clean, healthy odour. I am breeding Guernseys and Jerseys, and I constantly watch the excrement of these cattle, and I have trained my man to do the same thing, as the surest means of arriving at the proper understanding of the animal. If the excrement has a fermented, sour, or mushy smell, or an unnatural appearance, I set the animal to one side and examine him, and in that way I keep informed as to the

condition of my cattle. Now, winter dairying applies with us in this way; our cows are at rest in July and August when we are hurried with other farm work. They are dry, as a rule, for about sixty days. Then they commence to come in in September; and we calculate to have them if possible coming in in that month and October and November, until about the 1st of January, and this gives us a double advantage in butter making. Of course we want a few to calve in February, and perhaps a few in May and say one or two in June. In this way we keep up the flavour of our butter; for after a cow is in gestation six months her milk loses flavour; it becomes albuminous, the essential oils are taken up by the function of gestation, and we have little left in the butter but stearine; so that the proper flavour of good butter is not in it. We make our cows as a rule produce about 1,000 or 1,500 pounds more milk by calving in September than we can by having them calve in April; and I will show you why. If you start a cow in April, for instance, what do you get at the sixth or seventh month from that time to enlarge her production? You get absolutely nothing, but on the contrary she is shrinking; whereas if she starts in September she goes through two periods of increased flow, one at calving time and another when she gets to the fresh grass; and we have thus discovered that a cow calving in September will give from 1,000 to 1,500 pounds more milk than she would by calving say in April. But of course I am supposing that we have a good cow to start with. The profits of our cows vary very greatly. I can call to mind half a dozen dairies in my own county to-day, composed of Jersey grades devoted to butter making, that in the past season have averaged from $65 to $85 per cow in the season. Of course, alongside of these we have men who are contented as kittens with their own averaging $40. I do not know anything in all my experience so strange, in the way of a sandwich, as you can see presented in these streaks of lean and fat in the individual character of our farmers. I have been an observing student of the American farmer for about thirty-five years; I have been an actual student of dairying for over thirty years, and I have been confronted with this problem from the time I was a butter and cheese-maker in Madison county, New York, in 1856 down to the present time—the fact that a man will live right alongside a prosperous neighbour and shed example as a duck will shed water. (Laughter.) Let me give you a comparison. I visited a creamery in Illinois, and the proprietor put his books before me for inspection. I remained about two days. I may say that I am constantly travelling about getting statements of actual results, in the effort to get at this unknown quantity that I have been speaking of. This creamery man is gathering cream from different farmers, taking it into his factory and making it up. He showed me the account of one man who had thirty cows, and that man's total receipts were $20 per cow for the entire season. Right within a mile and a-half of him was another man who had twenty-two cows, and he sold from them $56 worth of cream per cow. This aroused my curiosity, and I paid these two gentlemen a visit. I went and saw the man who got only $20 a cow, and I told him the nature of my errand frankly. I said "I have been at the creamery, and I got at your status, and it excites a good deal of wonder in my mind, and I wanted to come and see you." I said to him, "you have thirty cows?" "Yes, I have." "You received this past year for your cream only $20 for each cow." "That is about it," he said. "Are you satisfied?" "Oh, I guess I am doing as well as any of my neighbours." "Is that so?" "Yes; I do not know as any of them are doing any better." "Does it pay?" I asked him. "Don't seem to with me." "How long have you been conducting your business in this way?" "About two years," he said. "What kind of cows have you?" "Natives," he replied. "Natives of what?" That was a proposition he could hardly get hold of, for he probably had not thought that that statement of a native cow was nondescript. I said to him, "I am going to ask you a few questions, and I want you to take them in a kindly spirit; I do not want to be inquisitive or offensive, but the fact which I discovered that you only get $20 per cow for your cream has aroused my curiosity. I am curious to know how you can content yourself with getting such an amount per cow when they cannot help but cost you from $25 to $30 to keep them." He said, "I do not believe it costs any such amount." I said "But do you know?" "No," he did not know. I told him about this neighbour getting $56 per cow, and he said it was a lie. (Laughter.) He didn't want to say I was a liar, but he acted as if he thought I looked like a man who was lying. (Renewed laughter.)

I had hard work to convince him that this other man was getting $56 per cow from his twenty-two cows. I tried to lead him carefully into a consideration of his own weakness, and to show that his administration of his affairs was very bad and unprofitable. I found in the first place that the man had no judgment of a cow; he had no understanding of what a dairy cow is, or how she should be handled and fed. In the second place he was not fit for his business in any shape; and in the third place he paid no attention practically to the work. His dairying business was simply incidental to his farm work. He was not a dairyman in any sense; he was running his thirty cows with no idea of making them a leading feature in his farm production. He was a general purpose man with a general purpose cow, and as a result he got general purpose returns. (Laughter.) The other man had a lot of cows composed of high Jersey grades. He devoted himself to the production of as much cream as he possibly could get. He handled for cream; he fed for cream, and he bred for cream; and the result was that he had $56 worth of cream to sell from every cow. I took every pains possible to point out the lessons to be derived from the experience of these men; I published the facts without giving the names, but simply stating that I had access to the books. Well, I did not arouse much enthusiasm, and I doubt to-day if the recital of that story has been worth a cent to anybody. But it has been worth something to me. So far as winter dairying is concerned, I am convinced that you are going to be confronted with it, and for the reason that you are dwelling in an essentially wintry climate. For fully six months in the year, if not more, you are shut up, eating what you have made during the other six months. You are like us in that particular; I do not think there is twenty days difference; and I have become convinced that in the contemplation of dairying we must strike at the question in this way: how shall we make 365 days pay each its share of the whole process? How shall we employ ourselves in the entire year? One change we have made is in the method of hiring help; we are hiring them by the year. We are changing the time of our cows coming in, so that in the winter there shall be active work for every day, in the care of our stock. We turn the whole year into an economic circle. We hire our help in this way more cheaply and more satisfactorily. We have better results; and I tell you if you look over the cash accounts of those men who are engaged in winter dairying, and compare them with the same force of cows in the hands of men who are engaged in summer dairying you will be struck with the difference. I have gone into the banks in my own county to ascertain the facts, and have tried in various ways to get at the practical prosperity of these men who are engaged in winter dairying; and I have been strongly convinced that this policy will make a man rich, provided he is fairly near a railway, while the greatest energy is rendered nugatory in the administration of an unwise policy. So much in the shape of a few words very randomly spoken on the question of winter dairying; and if you have any questions to ask I would rather answer them than make any more formal statement. (Applause.)

Mr. Dougald Leitch, (Caradoc).—What price do you get for your butter in winter?

Mr. Hoard.—At present 33 cents.

Mr. Leitch.—Where were those calves sold that you mention?

Mr. Hoard.—The calves that I mentioned are Jersey grade heifers. They are picked up very quickly by men who are desirous of pursuing a specific butter dairy business.

Mr. Leitch.—Then they are not bought for beefing purposes?

Mr. Hoard.—Oh, bless you, no—you might as well buy cats. (Laughter.)

Mr. Leitch.—We have a man in our neighbourhood who raises these calves and gets $100 for them; but when any business of that kind is established every person goes into it and the price is brought down. I may say that many years ago I was acquainted with Wisconsin; I am a reader of Mr. Hoard's paper, and I give it a great deal of credit for the good work it is doing in dairying, as I do to Mr. Hoard himself for his personal work in the same direction. We try to imitate his experience here and to follow his advice as well as we can, though I know we cannot come up to what some men are doing in Wisconsin. In the first place we have not the market that they have in the United States for the sale of butter. I try to make a good article of butter; I think that it is a little

better, perhaps, than the average; at any rate we can sell very quickly all we can make, but we get only 18 or 19 cents to-day while Mr. Hoard says they are getting 33 cents in Wisconsin. I believe that this district is just as good as the average of Wisconsin, or at any rate that part of it with which I am acquainted, and I went all along the coast from Chicago to Green Bay when it was newly settled. In the climate I do not think there is very much difference, but in the difference of prices they have a very great advantage. Another thing: no man need think of going into winter dairying unless he can construct suitable stables. We must have a good market, good stables, suitable cows, and give them suitable food, and the whole work must be done intelligently, as Mr. Hoard has said. There are many in Canada who, I believe, would go into it if they had the capital.

Mr. Hoard.—What is your foreign market for fine butter? You have easy and quick communication with England, have you not?

Mr. Leitch.—Creamery butter sold this summer at about 24 cents for shipping purposes.

The President.—Creamery butter is, I think, worth about that price now.

Mr. Hoard.—I do not think the price of butter has really so much to do with the return a man gets as his wise administration and economy, and keeping the business under his own eye. For instance, I have a cow that produced for me in 370 days, ending on the 15th October, a little over 400 pounds of butter. She cost me exactly $35 to keep for that length of time. Now, if I could have had the advantage of a little different arrangements I could have reduced the cost of that cow to about $25, and still made just as good a return. You see the advantage which this would give me; and I mention it to show you the importance of a study of the cost of production by the proper adjustment of feed and environment, stabling, housing, and other matters of that kind. For instance, there is the matter of giving them warm water. John Boyd says that a cord of wood is equal to about 200 pounds of corn in feeding a cow; and ex-Congressman Grinnell asked "How do you feed the wood?" John Boyd's reply was, "I employ the cord of wood to warm the water which I give my cows to drink, and thereby save myself the outlay for 200 pounds of corn to warm the water after the cow has taken it." It is true that we have, perhaps, the advantage of you in prices, because we have a large territory to ship to; but so far as making good creamery butter is concerned, if a foreign demand for it was established I believe there is just as much advantage in making it to-day for the English market as in making cheese for the English market. If I turn to the English market reports I am struck with the fact that they are paying a pretty big price for butter of a certain character. Now, why cannot you supply them in place of Normandy and other parts of France? It seems to me that you have here a chance of varying your dairy production; and I believe that if you studied out the problem you would find that you would have a really more stable market than we have.

Mr. Leitch.—I think that probably we are coming to that, especially if we could get a good line of steamers and refrigerator cars; but the great trouble with us is to get our farmers to pull together. We cannot make them understand when it is their interest to go into things of this kind. They are a hard class to educate, and we want to get them out to meetings like this, where they would be able to receive a good deal of light on this and other subjects to their own material advantage. The men we want to reach are the men who stay at home; and even if you had meetings in every school-house in the country, it would be a hard thing to drag some of them out. I have been urging this dairy business on our farmers for a long time, and telling them that they would be better off if they adopted it than by sticking so closely to stock raising and grain.

Mr. Hoard.—In olden time they would not believe if one were sent from Heaven; and it is so now.

Mr. Casswell.—I wish to say a word or two with regard to the Jersey and the native cows. When Mr. Hoard was speaking with regard to one of the cases he gave, in which the man was using native cows, he said that man was not fit for anything. I want to ask him what would have been the result if native cows hand been used by the other man? In other words, I would like Mr. Hoard's opinion as to the Jerseys and the native cows.

Mr. Hoard.—My own opinion is that the ordinary native cow is not used one-hundredth part as well as she deserves. (Hear, hear.) My opinion further is that any man can take the ordinary native cow, and by judicious handling and proper food he can enlarge her capacity for production as a rule nearly one hundred per cent. Why, in three years, by judicious handling and judicious feeding it is simply astonishing what you can do for the ordinary native cow. So far as the Jersey cow is concerned, I am convinced of the truth of this fact that, as Boccacio said, "Heaven needs the society of angels in order to make it heaven," so the Jersey cow needs intelligent men to handle her in order to make a good Jersey cow. A man needs to have a good education when he comes into the society of an animal as finely organized as that kind of a cow, and handles as productive a little machine as she is. He wants the education of motherhood; and I wish I could write that over the stall of every cow in the land; it might do a great deal for these noble, patient, toiling mothers, who are doing this dairy work for us. That is a point that we think too little about altogether. Mr. Ward C. White, one of our veteran western dairymen, gave utterance to an aphorism on this subject that has gone round the world. He said, "I always speak to a cow as I would to a lady." Too many reverse the operation and speak to a lady as they would to a cow, (laughter) thereby showing their lack of respect for all femininity. Ward C. White was a man of wonderful instinct and power, and when he uttered that remark with his genial, noble face beaming with enthusiasm and intelligence he would make any man love him. That saying of his is the essence of the law and gospel; it embodies our proper attitude of mind towards all femininity and all motherhood. Few of us, however, realize that spirit; we forget that cows are mothers; we forget how to use them and treat them. The ordinary native cow, if well treated, can be made a wonderful cow; and the Jersey cow if put under the same conditions as the native cow too often finds herself in, and obliged to rustle as she has to, would too often be beaten by her less aristocratic relative. You may put an intelligent, high-bred, finely organized white man into the conditions and environments of the Indian, and you only do it to the disadvantage of the white man, while you have not made an Indian of him either. The native cow is the product of her peculiar environment. She has nothing to take from; there is no purpose behind her breeding; but she deserves from every one of you a great deal better treatment than she usually gets. (Loud applause.)

The Convention then adjourned until 7.30 p.m.

At the opening of the evening session, the President having called the Convention to order requested Mr. Craig, Chairman, to read the report of the Committee on the Order of Business. The report was read and adopted.

CHEESE-MAKING IN EASTERN AND WESTERN ONTARIO.

Mr. A. Blue, Secretary of the Ontario Bureau of Industries, then read the following paper:—

In its physical relations, as well as in the vastness of its extent, this province of Ontario is far from being as well known as it should be, to its own citizens. Its place on the world's map is peculiar. The great fresh-water lakes sweep in a semi-circle about it to the south and west; on the north it is washed by Hudson's Bay; to eastward a country more than six hundred miles across lies between it and the Gulf, while the counties on the St. Lawrence nearest to the Atlantic are inland three hundred miles. It rises geologically from the oldest sedimentary rocks, the Laurentian, in the east and north, to the comparatively recent Devonian in the south and west. Its area, exclusive of the lakes, is greater than that of Ohio, Indiana, Illinois and Michigan by 10,000 square miles; greater

than the New England States with New York, New Jersey, Pennsylvania and Maryland by 25,000 square miles; and greater than Great Britain and Ireland by 78,000 square miles. The portion of it drained by the Moose river alone equals in area the whole of England; and according to the reports of explorers it does not appear unlikely that even this far northern region, on the arctic slope, may yet grow extensive crops of cereals and roots, and graze the cattle of a thousand hills.

In a country so situated, of such vast extent, and comprising such rock formations, it must be that there are great diversities of soil and climate. Stretching across ten degrees of latitude, and subject in several distinctive regions to the varying influences of land and water tracts, it is inevitable that there must be differences in the length of the seasons, in the range of temperature, and in the volume of precipitation. Even in portions lying between the same parallels, inequalities of climate are sometimes found, the full effect of which on growth and production we cannot wholly realise without the careful records kept at the weather stations. Between the south-western portion of the province, lying within the half circle of the lakes, and the eastern portion, around lake Ontario and down to the Ottawa river, there are well known differences of climate as well as of soil. The growing and ripening season in the lake Erie counties is fully two weeks longer than in the counties on the St. Lawrence; and excepting in the regions of higher altitudes this advantage is possessed by nearly the whole of the west over the east. The formations of the two portions of the province are also very distinct,—those of the east being Laurentian and Lower Silurian, and those of the west Upper Silurian and Devonian. In the latter there is generally a great depth of alluvium, ranging from fifty to three hundred feet, while in the former the country rock is in many places exposed. Both divisions are well watered by rivers and streams, and although the average rainfall is higher in the west, a large portion of the east is literally a lake country. Between two districts so different in physical character there should be found the elements of an interesting comparison in such a subject as the dairy industry, and a comparison of them as shown by the cheese statistics of three years is the object of this paper.

For the purpose of the comparison I have placed in the eastern division the counties of Lincoln, Wentworth, Halton, Peel, York, Ontario, Durham, Northumberland, Prince Edward, Lennox and Addington, Frontenac, Leeds and Grenville, Dundas, Stormont, Glengarry, Prescott, Russell, Carleton, Renfrew, Lanark, Victoria, Peterborough and Hastings; and in the western division the counties of Essex, Kent, Elgin, Norfolk, Haldimand, Welland, Lambton, Huron, Bruce, Grey, Simcoe, Middlesex, Oxford, Brant, Perth, Wellington, Waterloo and Dufferin. In the former there are twenty-four counties, with an average of 421 factories in operation during the three years 1883-5; in the latter there are eighteen counties, with an average of 292 factories in operation in the same period.

The first comparison, as presented in the following table, is made from the statistics of all factories from which returns have been procured in each of the three years. It is a comparison of the total quantities of milk used, cheese made and value of cheese, and of the averages of quantity of milk required to make 100 lbs of cheese and of values of cheese and milk per 100 lbs. respectively:—

WESTERN COUNTIES

——	1885.	1884.	1883.	Total.
Number of factories making returns.	218	236	190	644
Milk used ..... lbs.	249,420,267	240,854,021	194,716,014	684,990,302
Cheese made ..... lbs.	23,849,732	23,036,986	18,908,923	65,795,641
Value of cheese ..... $	1,990,770	2,477,678	2,010,611	6,479,059
Average pounds milk to make 100 lbs. cheese.....	1,046	1,046	1,030	1,041
Average value of 100 lbs. cheese..... $	8.35	10.76	10.63	9.85
Average value of 100 lbs. milk..... cts.	79.81	102.88	103.26	94.59
Average per factory of milk used ..... lbs.	1,144,130	1,020,576	1,024,821	1,063,650
do do cheese made ..... lbs.	109,402	97,614	99,521	102,167
do do value of cheese ..... $	9,132	10,499	10,582	10,061

EASTERN COUNTIES.

——	1885.	1884.	1883.	Total.
Number of factories making returns	318	331	250	899
Milk used.....lbs.	273,348,840	277,045,782	179,246,705	729,641,327
Cheese made.....lbs.	26,906,139	27,501,946	18,170,973	72,579,058
Value of cheese.....$	2,130,064	2,806,447	1,862,317	6,798,828
Average pounds milk to make 10 lbs. cheese.....	1,016	1,007	986	1,005
Average value of 100 lbs. cheese.....$	7.92	10.20	10.25	9.37
Average value of 100 lbs. milk.....cts.	77.93	101.30	103.89	93.18
Average per factory of milk used.....lbs.	859,588	836,996	716,987	811,614
do do cheese made..lbs.	84,610	83,087	72,684	80,733
do do value of cheese.....$	6,698	8,479	7,449	7,562

Reduced to annual averages for the period, it is shown that the quantity of milk made into cheese was 1,063,650 lbs. per factory in the west, against 811,614 lbs. in the east; that the cheese product per factory was 102,167 lbs. in the west, against 80,733 lbs. in the east; and that the value of product per factory was $10,061 in the west, against $7,562 in the east. The question whether greater economy of production is got under the larger output can only be answered from general experience. A good deal depends on the number of patrons, the number of cows whose milk is supplied, the radius of the district tributary to a factory and the nature of the roads, as well as on the plant of the factory and the skill of those employed in it. There can be little doubt, I think, that up to a certain limit of the cost of haulage, and other things being equal, the factories of large capacity have the margin of profit in their favor; but on this important aspect of the industry we have no data upon which a trustworthy calculation can be made. The eastern factories are rapidly increasing their average of a season's supply of milk, and the fact of their doing so may be accepted as evidence that an increase of supply is found to give improved results.

In one other respect the comparison is decidedly in favor of the eastern counties, viz: in the curd-producing quality of the milk. In 1883 the average quantity of milk required to make 100 lbs. of cheese was 986 lbs., in 1884 it was 1,007 lbs., and in 1885 it was 1,016 lbs., being an average for the three years of 1,005 lbs. In the western counties the average of 1883 was 1,030 lbs. and in each of the following years it was 1,046 lbs., or an average of 1,041 lbs. for the three years. How is this difference accounted for? Is it owing to the larger infusion of the blood of dairy breeds in the east? or to the richer pastures? or to a combination of these and other causes? The permanency of the result—for it appears to be continuous and uniform—implies that it is due to the operation of some fixed agency, and the importance of it points out the subject as worthy of careful investigation. If, instead of an average of 100 lbs. of cheese for 1,041 lbs. of milk in western counties the average was the same as in the east, the total cheese product for three years of the factories making returns would be increased by 2,362,000 lbs.: and computing for all the western factories in operation, it would be increased by 3,210,000 lbs., which at the rate realised during the period would reach a value of $315,000. Is it possible for the west in this particular to attain the standard of the east? If the secret is due to peculiarities of soil and climate, it may not be possible; but if it is due to the strains of dairy cows, the way to reach the standard is plain and easy.

The table gives us another comparison between east and west which, I think, is deserving of serious consideration by eastern dairymen. The value of cheese is uniformly higher in the west than in the east. In 1883 the average of western counties' manufacture was $10.63 per 100 lbs., in 1884 it was $10.76, in 1885 it was $8.35, and for the three years it was $9.85. The average of eastern counties' manufacture was $10.25 in 1883, $10.20 in 1884, $7.92 in 1885, and $9.37 for the three years. These are the records of prices, as shown by factory returns in the two districts for the several years. How do you account for the difference? Eastern makers are nearer to the seaport than western makers. The dealers and shippers are men of repute in the trade, and from what I know of cheese

dealers in Ontario I would not place them second to any men of their class in America. Where, then, is the fault? Is it in the poorer quality? and is the poorer quality due to the milk, or to the making and curing of the cheese, or to some other cause? These questions I leave you to answer: I cannot pretend to answer them. But the figures are as I have given them, and they mean that in the total product of cheese made in eastern Ontario in the three years 1883–5 there was a loss compared with the prices realised for western Ontario cheese of $488,000. That is to say, the eastern makers got $169,000 a year less for their product than the rates for western cheese would have given them, or an average of $400 less for every factory in operation in the district. In every industry profits are the last items which make up the prices of commodities, and every defect of quality is an element reducing the maker's share of the gain.

I come now to compare the eastern and western cheese districts of the province in another form, and I shall venture to do little more than present the statistics showing how they stand in relation to each other. The following table is prepared from factories which in each of the three years gave a detailed statement of the quantity and value of product, number of working days in the season, number of patrons, number of cows whose milk was supplied, and the quantity of milk supplied. Its chief value is in the results computed from the data given.

	Western Counties.				Eastern Counties.			
	1885.	1884.	1883.	1883-5.	1885.	1884.	1883.	1883-5.
Number of factories	180	180	155	172	253	265	230	249
Number of working days	159	162	159	160	156	158	155	156
Averages per factory of—								
Number of patrons	74	68	67	70	51	44	41	46
Number of cows	391	383	361	379	334	337	268	315
Yield of milk per cow—								
For the season ....lbs.	2,953	2,882	2,861	2,903	2,704	2,548	2,714	2,645
Per day....lbs.	18.57	17.79	18.00	18.14	17.33	16.13	17.51	16.96
Product of cheese per cow—								
For the season ....lbs.	282.72	275.60	277.68	278.89	267.22	253.01	275.12	263.70
Per day ....lbs.	1.78	1.70	1.75	1.74	1.71	1.60	1.77	1.69
Value of product per cow—								
For the season ....$	23.60	29.76	29.63	27.52	21.13	25.82	28.21	24.74
Per day ....cts.	14.87	18.37	18.64	17.20	13.54	16.34	18.19	15.86

The first noticeable fact here is the difference in the number of working days of factories in the two districts—160 days in the west and 156 in the east being the annual averages of the three years. This is purely a difference of climate, and it affects all the results of yield, product and value. But while it does this, it is apparent that the west possesses other advantages, seemingly as permanent as the one due to a longer working season. The excess of 258 lbs. in the yield of milk for the season, given by the western over the eastern cow, is mainly owing to its daily excess of 1.95 lbs. Its excess of 15.19 lbs. in the season's product of cheese is also mainly owing to the daily excess, although the proportion of it is reduced by the superior curd-producing milk of the eastern cow. The value of product per season is also governed by the excess of milk yield, with the better price realised for western cheese further in its favor. The season cannot be changed by any effort of man, but it ought not to be regarded as impossible to increase the average of the milk yield and the cheese product, and with this increase to so improve the quality as to make an end of all distinctions between east and west.

Mr. Leitch—Mr. Blue asks the reason why we require more milk to make a pound of cheese in western Ontario than they do in the east. I may say that when I commenced to make cheese I found I could make a pound of cheese out of ten pounds of milk, but last year the quantity required was 10.60 pounds. Though I have never seen eastern

cheese, I think I know the reason why they require less milk than we do to the pound of cheese. From what I have heard stated by cheese buyers, I think it depends a good deal on the quantity of moisture. It is well known that it is in the power of the cheese maker to make a cheese either moist or dry. A well cured cheese should have between 32 and 35 per cent. of moisture; and if you make the percentage of moisture one or two degrees more or less than this you will soon disturb the average. If you want to make a good, sound, meaty cheese which will keep for a long time, I think you require a little more than ten pounds of milk to the pound of cheese. I contend that the eastern dairymen are not so far advanced in this matter as we are, and I think, perhaps, they do not get as high prices. Buyers have sometimes told us that cheese was selling cheaper in Brockville and other places than it was here; and I replied to them that as they were nearer to Montreal at those places, why did not they go down and buy their cheese. Still they came back and were willing to give us half a cent or a cent more than they would have had to pay in the east. They admitted the reason at last—that our cheese was better. I think that even though it takes a little more milk it pays in the long run, and we find a better market in the old country. With regard to Mr. Blue's paper, I may say that I have tried to fill the schedules of the Bureau of Industries as well as I can; but with regard to the questions that are asked in some of those schedules as to the product of a cow, I would like Mr. Blue in publishing his report on these statistics to give as much latitude as possible on that point. Even among our dairymen it is impossible to get at the exact number of cows that we get milk from. We commence in the spring with a certain number; but throughout the season that number increases, and probably for the last three months in summer we get the milk of one-third more cows than we did in the early part of the season. In the returns we make to Mr. Blue. we take the total number of cows, and if you spread this over the whole season it diminishes the apparent product, and gives us and our cows a poor reputation. Last year I made up the milk of between 1500 and 2,000 cows, I kept track of the product, and I know that our cows in the west are very poor that don't give over 3,000 pounds, provided they commence about the 1st of May and continue until the last of October. But we do not get the full product in the early part of the season, and you must deduct about one-third off for the rest of the cows, and that will bring it about right. I try my best to fill in these papers as well as I can; but I find from experience that if you were to increase the product one-third more than we give, it would be nearer the mark.

Prof. Robertson.—I am very much pleased with the paper which has been read by Mr. Blue, and as dairymen I think we should be grateful to one outside of our own business who takes the trouble to give us so many important facts from which we may learn very many valuable lessons. The facts put before us to-night impress on me the necessity of emphasizing one or two lessons from a dairyman's standpoint. With regard to what Mr. Leitch has said as to the information sought for in these returns from the bureau, I may say that I believe there are not more than one half of the factories that send complete returns, according to Mr. Blue's paper. Now, to make these returns as valuable as they should be, they should be complete, and every dairyman in the province should do his part towards making them complete. If the effect of Mr. Blue's paper is to show that our cows are not giving as large a yield as they should give, and if it should stimulate our dairymen to feed and treat their cows so as to give more milk it will have a beneficial result. I may say that my experience does not agree with that of Mr. Leitch, for I find that the average yield of Ontario cows is not more than 3,000 pounds per season. I think it is a fact to be deplored that they do not yield more, and perhaps the knowledge that the yield is so low, will stimulate all concerned to increase the quantity. I may say that one year I offered premiums to those patrons of one of the factories with which I was connected, whose cows would produce the largest quantity of milk: $30 for the first, $25 for the second, and so on, the amount aggregating some $125; a portion of which, some $75 or $80, was contributed by the factories. This was for the purpose of inducing the patrons to do their level best that year. A spirit of emulation was introduced, but either from lack of knowledge, or the inferior quality of the animals which were kept, I found that there were only six, out of about 115 who competed, whose cows gave more

than 3,000 pounds each, in a period of five months and one week. If only that number reached that maximum it shows that the general average of the factory was a long distance below that standard. I averaged the quantity of milk received from over 700 patrons, and I found that the average was below 3,000 pounds of milk per cow for the season. Statements of this kind should lead dairymen to investigate the reasons for this low production, and induce them to apply the proper remedy. Mr. Blue points out that the dairymen of eastern Ontario realized some $488,000 less in four years for their cheese than they would have realized had they sold for the prices obtained in western Ontario, while on the other hand the west lost the sum of $315,000, as compared with the east, in respect of the larger quantity of milk required to make a given quantity of cheese. I may say that I can account for some of the loss in the west by the method of making and curing the cheese, as the cheese is better cured before shipment in western Ontario than in the eastern counties. It is possible, in fact, that in the west we are making our cheese too dry, and that we should make a greater quantity of cheese than we do at present from a given quantity of milk. I found that some of the eastern cheese has been quite equal to the western cheese in point of quality ; and though I do not advise makers to make their cheese soft and mushy, still it is worth investigating why we cannot make the cheese just as good in quality, both for immediate consumption and for keeping, and still leave a little more moisture in it, for if we can it will put money in our pockets. On the other hand, I think that perhaps the eastern men could save a part of their loss in prices by making their cheese a little dryer, if it is found that their present loss is due to making their cheese too moist. I would suggest these various questions as proper ones for discussion, and no doubt they will afterwards come up in this convention. I do not by any means take it for granted that merely because we take more milk in the west to make a pound of cheese, therefore it is a better quality of cheese. If we can make cheese just moist enough to please the English eater and the English shop-keeper ; and if by making it a little moister we do not injure its quality, or its keeping properties, we would be wise if we improved our practice in that respect.

Mr. Blue.—As to the practical questions involved in this discussion, of course I shall not venture to deal with them. With regard, however, to the quantity of milk per cow, I may say that the schedules that are sent out ask for the average number of cows whose milk has been supplied, and not for the maximum or the minimum number ; the average for the season is what is asked for. If the cheese-makers who fill up the returns misapprehend the meaning of the schedules in that particular, I do not know that the fault is mine. I think that the schedules are perfectly clear ; but I am also aware that it requires some care to ascertain the average number for the season, though it is not, after all, a very difficult matter. I think that the question is of sufficient importance to justify me in asking the cheese-makers to take the trouble to ascertain the actual average for their respective factories.

Mr. Leitch.—I quite agree with Mr. Blue that the schedules are very plain, and that there is no difficulty in that respect. The defect is in another direction. Say that there are a hundred patrons sending milk to the factory ; some of them will send all their milk for some weeks, or even for the whole season, but there are generally some who retain a certain quantity at home, and unless you could fill up the quantities from day to day—and you could only do that by visiting every patron—it is impossible to ascertain the actual quantities. I am anxious to ascertain the facts as near as possible, so as to make these statistics correct, as I fully comprehend their value ; but, as I have said, it is impossible to to do so unless we employ a man from day to day to ascertain the exact quantity of milk that is sent. If the same number of cows were supplying milk every day from the opening of the season to the close, it would be an easy matter, but we know that that is not the case and that at certain times patrons may want to make a little butter, or to keep a mess or two of milk at home for other purposes, so that we cannot be certain about it.

Mr. Casswell.—In what I am about to say I hope that no gentleman from the east will think that I am attempting to raise any controversy or emulation between the east and the west. Though I am not a cheese-maker myself, I believe that the drawing out of the curd product has a great deal to do with the results ; and I think on that point we

might be able to get some information from Mr. Macpherson and Mr. Ballantyne, who are both practical men. I have always understood that years ago our cheese was superior to the eastern cheese; but of late years I believe the eastern cheese has come up more and more to the quality of the west in some instances; and that is the report from the old country as well. My idea and my experience has been that what makes our cheese of such exceeding excellence is its flintiness and keeping qualities; that it is those qualities that have put our Canadian cheese ahead of the United States cheese for some years back. I understand that in keeping qualities Canadian cheese stands as the cheese *par excellence* in England. Now, we find that where the best cheese is made it takes about 1040 or 1050 pounds of milk to make 100 pounds of cheese. I would like to ask Mr. Macpherson if the quality of eastern cheese has not come up considerably within the last two or three years as compared with previous years, and I would ask him also if it has not been the case that in those instances in which their cheese has reached that higher quality, it has been made in particular factories where they have a larger average of milk to the given quantity of cheese than has proved to be the case from the whole statistics of the country. Another fact which must be taken into consideration is that they market their cheese earlier than we do, which would make a difference. At any rate, I think these are questions that are worthy of our consideration. Then, with regard to the difference in quality, there must be a difference in the quality, bulk, or otherwise, for allowing for the difference in freight in this section and from the east we should have to allow for a little higher price in the west. I am very glad that Mr. Blue has brought out these facts, and I hope that they will be fully discussed.

Mr. D. M. Macpherson (Lancaster).—The questions asked by Mr. Casswell are somewhat important. I may say in the first place that the quality of eastern cheese has improved very materially the last two or three years, and we hope some day that we will be able to excel the western cheese-makers. If we keep on improving, I do not know but what we will, but at any rate I have no doubt that we shall strive to do so. With regard to this question of whether the average in our best factories—those producing the best cheese—is as high as 1045 or 1050, I may say that I have had no experience with any factory in the east that has gone to as high a standard as that. There are so many different data to figure on that I do not think that I could make any comparison in that respect. What I think we have to do is to seek to make the best possible quality out of the milk; that is the first consideration for the maker, and the quantity of milk required to make a given quantity of cheese is a secondary consideration. I believe we get a better milk in the east than you do in the west. We have in that section a sprinkling of the French native cow in many districts, and I have no doubt that she gives a richer milk than the native cow does here. That is a factor which would change the result very materially. Then, again, as has been suggested by one or two gentlemen, the yield of cheese from a given quantity of milk depends very greatly on the amount of moisture left in the cheese. If you increase the moisture one per cent. in the cheese, you have of course one per cent. more cheese than you would have if you made the cheese dryer. I believe as I have said before, that the first aim with every maker should be to make the best possible article that he can, using due care and economy to save all the solids in the milk, and then just leave sufficient moisture for the purpose of assimilation and producing the consistency in the cheese which is necessary to obtain the highest price. There are many samples in the west that I have seen that would be much improved if there were two or three per cent. more moisture in them, but not more than that percentage. I might also say that much of the cheese produced in the east would be very much improved if from one to three per cent. of the moisture contained in it was taken out of the curd.

Mr. Leitch.—Have you tested your milk to find out the percentage of fat in it? Do you know the quality of the milk?

Mr. Macpherson.—I am almost certain that we get a better quality of milk.

Mr. Leitch.—How do you test the milk?

Mr. Macpherson.—We have the ordinary test of cream setting, and we have the lactometer.

Mr. Leitch.—Do you ever use an instrument recently brought from Germany called the lactoscope?

Mr. Macpherson.—Yes, I have used it. I may say that I have not the figures to-day showing the results with our milk, but I am satisfied that the sprinkling of the French native cow, which, I believe, has come down from the Jersey breed, has produced a richer milk than we would otherwise have.

Mr. Leitch.—I may say that we have a club who have been testing cows of these various breeds for the last two years, and it is a singular fact that if you take good specimens of these several breeds they come much nearer together than is generally supposed. I have a Canadian cow without a sprinkling of blood in her; I tested her milk this summer, and I found that it had between 4 and 5 per cent. of fat, and I have another, which is nearly thoroughbred Durham, that hardly went three and a half per cent. If one were to judge by her appearance she should be the best in the herd, but her milk does not come up to the other. In the tests which were made at the Model Farm, of milk taken from cows of different breeds and analyzed, and test with the lactoscope, it was found that the highest average was from a grade shorthorn. From what I have seen I have come to the conclusion that breed has little or nothing to do with this question of milk production if you select your cows properly and keep them properly. I may say that this lactoscope is a very simple instrument, and that with it you can make tests almost as closely as by analysis. Indeed, in some respects, I do not know but it is better. It is the invention of a German professor, and we know the Germans are far ahead of us in such matters as these. I think every dairyman should get a lactoscope, and with it in his hands it would dispel many false ideas that we now have. There is a good deal said about the milk producing qualities of Jerseys and Holsteins, but I think you could get among the cows of the country, by a proper selection, some which would show just as good results as any imported cows.

Mr. Casswell.—Has it not been the tendency in the east for the last few years to make cheese with a little less average of moisture than a few years ago?

Mr. Macpherson.—Yes; I think the tendency is to make a dryer cheese.

The President.—Mr. Casswell has asked my opinion, but I do not know that I can throw very much light on the subject. I may say in the first place that I value Mr. Blue's paper very highly, showing, as it does, the statistics of the east and the west in this matter of cheese production, and the comparisons that may be drawn between them. It is the first time that we have had any such comparison of statistics, and the method adopted by the Bureau of Industries is the only one we have of collecting these facts, from which we can draw these valuable comparisons and conclusions. I think the figures, with the exception of the average quantity per cow, are as correct as they possibly can be, because I do not think there is any difficulty in getting at the total quantity of milk and cheese, the price obtained for cheese, and other details of that kind. I quite agree with Mr. Leitch, however, regarding the impossibility of giving the exact number of cows which are supplying milk to a particular factory; even if you were to go to each individual farmer you could not get it exactly. The tables show that for three years a higher price was obtained for cheese in the west, notwithstanding that the freight was higher, but that it took a greater quantity of milk with us to make a pound of cheese. Now, what is the cause of that? It is true that nobody wants a hard, dry, poor cheese, and the proper quantity of moisture to put in our goods is a question of very great importance. The fact remains, however, that our cheese has sold for the higher price; some years ago the difference was much greater than it is now, but of late the quality of their goods is approaching ours more closely. I hope, however, any statements that have been made to-day will not induce any maker to go away with the idea that he should try to make a larger yield of cheese from a given quantity of milk. As between the two evils of too dry and too moist a cheese, I think we would rather have the cheese a little dry, so that it would not run the risk of not keeping; it should not be made so that it will perish in the night, for the old adage of soon ripe soon rotten is as true as the gospel in regard to cheese making. Mr. Macpherson and I saw in England some cheese made in July which was being readi-

ly bought up; it was in perfect condition, of fine flavour and colour, and without any sign of decay about it. I asked with regard to this cheese, and the gentleman who had it told me that they preferred a cheese which was a little dry rather than one which was a little moist. I said, "It is not what you prefer yourself, but what do your customers prefer?" and he replied that their preference was for a cheese which was a little dry and hard rather than for one which showed a tendency to too much moistness. This is a point of very nice importance, but it is one which you cannot learn here; it can only be learned by experience, and by knowing the exact quantity of rennet and salt to be used, and the exact time and method of dealing with every stage of the manufacture. I dare say there are other questions besides that of moisture that come in in this comparison between eastern cheese and western cheese; for one thing, as has already been pointed out, as a rule they do not keep their cheese so long in hand, especially in the fall. I think that perhaps by the middle of November it is generally cleared out of the factories.

Mr. Macpherson.—Invariably.

The President.—I have always said that everything else being equal, they should be able to make finer goods in the east than we can, because they have finer pasture and the land is better watered. Still we have been making a cheese which, at all events, has obtained the highest price, and I think Mr. Macpherson will corroborate what I say. Year before last they were kept a little longer in the factories on account of the low price; they were shipped to England, and though they were kept lying there, losing at the rate of half a pound per month, still they were of the very highest quality. If that cheese had been a little too moist, it would not have brought within twenty shillings per hundred of what it did bring. There was a time when we made this soft, sloppy cheese that was the terror of the trade and of every exporter. Our English correspondents kept cautioning us against buying this fall cheese; but of late years we find that the fall cheese keeps just as well as the early cheese, when made in factories where the makers understand the proper methods of making their cheese. All these things go to show that the difference must be, after all, in the quality. There is no favour in business, and if the goods are not worth the money, the money will not be paid. But, as Mr. Robertson has said, the people in the east are advancing rapidly, and they are quite in a position to pass us, because, as I have said, everything else being equal, they have decided advantages over us. They made a superior quality of butter under the old dairy system, and obtained the highest prices, and I dare say it was largely the result of the quality of their milk, because their country is much better watered than ours, and they are more favoured in the matter of pastures.

Mr. Hoard.—I may say that I am now using on my table some cheese which was bought from Mr. Casswell last fall, for exhibition at our annual dairymen's show. They were made in August, a year ago, and though they are now nearly a year and a-half old, they are still very fine for cheese of that age. With regard to this question that you are discussing, it strikes me that, after all, it is very largely one of farm administration. I do not believe that the difference you have shown here is clearly a difference of moisture or factory manipulation; but I do believe it has more to do with the percentage of solids in the milk. I wish to call your attention to one point. This summer a severe drought prevailed in Wisconsin; and the first thing we knew, a great cry went up from our patrons all over the state, accusing cheese-makers of a lack of ability; it was found that it was taking thirteen pounds of milk to make a pound of cheese. We had not a drop of rain for four or five weeks. A strange thing was shown to us with regard to the economy of food. The cows were shrinking in their milk—in the solids of the milk, showing that there was a necessity for a certain amount of succulence in the grass in order to produce these solids, although the cows were getting fat at the same time. We commenced feeding bran instantly. The papers took up the matter and advised the farmers to feed their cows. Over 400 car-loads of bran were unloaded in our county in a few weeks, and immediately the milk came up to the percentage, though it had previously been reduced down from thirteen to about ten. If you don't put the solids into the milk you will certainly not get them out again. (Applause.)

Mr. Hawkins.—I see that eastern as well as western men have begun to increase the quantity of milk to the pound of cheese, and that while the eastern men have increased

19-100ths, the western men have increased something like 16-100ths. It would seem that in each district they are going on and gradually increasing the quantity of milk to the pound of cheese. Now, doesn't it strike the members of this convention that this is due to other causes apart from the question of moisture; possibly from what has been suggested here before, that our pastures in the older districts have had a good deal taken away from them in the shape of the elements of food, which are not being replaced again. Are we not taking a certain amount away from our pastures in the shape of solids which are not being returned to them in the shape of manure; and if so, unless we make a revolution in our manurial system, it is going to take a still greater quantity in the future than it has in the past. In the older districts I believe it is uniformly the case that more milk is required to a pound of cheese than in the new. I would ask Mr. Macpherson and Mr. Ballantyne if that is not the case.

Mr. Macpherson.—That, I believe, is the fact.

The President.—I think that is the case.

DAIRY FARMING IN DENMARK.

The President.—I have now much pleasure in introducing to you Prof. Robertson, who will address you on the subject of "Dairy Farming in Denmark."

Prof. Robertson.—In speaking for a short time on the subject of "Dairy Farming in Denmark," I think I may perhaps be justified in devoting a few sentences of my address to the question of the education of the farmers of that country. Denmark deserves great credit for the attention it has given to agricultural education; and while the education of the farmers of that country has received great attention at the hands of the government, yet the government has not been the sole support of those institutions that have been instrumental in educating the Danish farmers. In Canada the impression has gone abroad that the Danish government has been so kind to the farmers as to pay for the whole education of the youth of both sexes. The Danish government has done just what our President recommended as the proper course for the government this afternoon —that of merely helping those who help themselves. The Danish government has never been willing to maintain any institution for the benefit of anybody, unless the persons who were to be benefited were themselves willing to contribute to its support. With regard to how they have inaugurated and sustained those institutions, I may say that the Royal Agricultural Society of Denmark has been an important factor in educating the farmers how to make dairy farming profitable. As long ago as 1769, the Royal Agricultural Society had its commencement. In has occupied in Denmark very much the same position that the Agricultural and Arts Association has occupied in this province, but it undertook this work, which has resulted very much to the benefit and profit of the people of Denmark—that of apprenticing the farmers' sons to the best farmers all over the kingdom. Farmers' boys who were anxious to receive instruction in the best methods of farming were taken as apprentices for three years. They were required to be possessed of good moral character, and to have recommendations from a magistrate and a clergyman before they were accepted as apprentices. This was the system adopted: they were each sent one year to a farmer in one part of the kingdom; the following year they were sent to a farmer in another part, and in the third year they were moved to another part. In that way the young men became acquainted with the different methods of farming which were pursued in different parts of the kingdom, and learned to compare them one with another, and to think for themselves, which is, of course, a very essential part of any education. Well, the demand for apprentices and the desire for apprenticeship outgrew the capacity of the society for superintending that work, and it became a practice for young men themselves to apply to farmers of good repute to be taken as apprentices on the same conditions as those who were placed by the society. Thus the leading farms of Denmark became each an agricultural centre where the boys from other

farms went to learn farming. This was carried even to this extent, that one farmer would have another farmer's sons on his farm, learning his system, whilst number two was doing the same for the sons of number one. You will see at once the advantages of that system. A boy being trained at home learns to follow the routine of that particular farm. He then goes on to another farm, and then to a third, learning the systems which are practiced on all of them, so that he is able to adopt the good from each, to be afterwards utilized on his own farm, while he ignored anything he could not adopt in his own practice with advantage. It has become so general a practice, that on one large farm I visited there were seventy students working for the owner, and learning how to farm. Now, the student's education was not by any means half play and half work, and I mention this for the purpose of encouraging young men to pursue studies for the improvement of their minds, even while they are labouring hard all day. The students were required to work from four in the morning until half-past seven every day except Sunday. The very length of their hours, and the ardour of their labour, had the effect of quickening their mental powers. I would not advocate that system of hours for our young Canadians, because I think the average Canadian youth can do as much in ten hours as the Dane does in fifteen; but I merely state these facts to show you that these young men, while they work hard at manual labour, do not neglect their mental improvement, but study the science as well as the practical work of farming. To pass on to the subject with which I propose more particularly to deal, I may say that this same society, as early as 1837, recognized the value of the dairy industry to that country, and the importance of dairy instruction. It took some steps to learn the best dairy methods followed in their own and other countries, and by means of pamphlets and lectures set out to try and improve the manufacture of butter. By 1860 they had engaged the services of Prof. Segelckè, whose whole time was spent in directing and apprenticing young men and young women in dairy schools. These schools were doing nearly the same for the dairy interests of the country as the system I have mentioned had been doing for agricultural operations generally. Each dairy that had been successful in making the best butter—and I may say that that success was judged by the price in the market—became a school for dairy instruction, and was patronized by this society's apprentices, so that all the apprentices sent out under the auspices of this society, received instructions in those methods of dairying, which had been proved to be the most successful in practical operation. Up to 1864 young women were the only apprentices sent out by this society, but in 1864 Prof. Segelckè undertook to apprentice young men, and from 1864 to 1885 inclusive, some 945 young men had been apprenticed in this way. You can at once see the advantage of such a system to a small country like Denmark, with a limited population; a system which, during those twenty-two years, educated nearly one thousand young men in the science and art of making the best butter and cheese. But as in the case of the system of apprenticeship for general agricultural instruction, the demand among those who desired to be apprenticed outgrew the capacity of the society, so that it became the practice for farmers' sons and daughters to apprentice themselves to good dairy schools, on the same terms and conditions as were observed when they were put out under the auspices of the society. In these dairy schools a small fee or premium was paid to the head dairymaid, while on the farm a small wage was paid the student—$8 being about the fee for a two months' course in butter-making, besides the labour contributed. I find that in Denmark, as a result of this system they have been most successful in dairying. Each youth was furnished by the superintendent of the society with report forms, wherein he recorded every day's operations in the dairy—the quantity of milk and cream, the temperatures and everything of that sort. In that way he was trained in the habit of close observation and careful record of the various operations of dairying. Now, if any science or art requires accuracy and care on the part of those engaged in it, it is the art of making butter and cheese, and this method was very successful in encouraging those habits in young men. These reports were handed to the superintendent once a week, for examination and for correction, if necessary. In that way a constant outside supervision was exercised on these young men, and they were thus induced to do the very best work of which they were capable. The effects of that system in Denmark have been such as to make me desire to see a more thorough system of instruction and supervision in this

country, for I do not think our cheese-makers do as well as they could do and would do, if they had some regular supervision, and were induced to keep correct and complete records of each day's work in their dairy operations. By following this system, Denmark has come to be called a nation of dairy farmers, a name which she justly deserves, and an honour which is very proudly worn by her people. All the time I was in Denmark I heard no complaint of hard times, while if a stranger came to Canada, I think he would be extremely fortunate if he did not hear some little complaint of that sort. I attribute their success and the fact of their now making money out of this industry to their going into dairy production as a business—to their having gone into it, in a sense, as a specialty. However, they have not made it a success to the exclusion of every other department of farm work, but have merely made it a specialty in the sense of making other farm operations subservient and helpful to that interest. They have been successful for the same reason that men are successful in any calling. I have great faith in having a definite knowledge every morning of what is intended to be accomplished during the day. The old Quaker, whose house was about to be burglarized, said to the stranger, "I intend to shoot just where thou art standing, and unless thee gets out of the way thee will get hurt." The old Quaker was bound to aim at something, and he was likely to strike it; but if either young men or old men, whether they are general purpose farmers or dairy farmers, aim at nothing, they are likely to hit nothing. The Danes have made dairying a success by making a specialty of it, and thereby they make all their farm operations more profitable. To confirm this, let me state that their statistics show that while Denmark has exported more fine butter per acre of the land in the kingdom than any other country, she has also exported more cattle per acre of her kingdom than any other. Indeed she has exported more fat cattle per acre than any other country in the world, showing that dairying and fattening cattle are not antagonistic, but that dairying has the effect of enabling the farmer to develop his resources generally, and make more money from his farm. The figures which make this showing have been tabulated from statistics supplied by Mr. Blue. From 1869 to 1872, Denmark exported 69,838,730 pounds of butter. From 1870 to 1875, Canada exported 61,976,234 pounds of butter. At that time it will be seen that Canada was not very far behind Denmark. During the former period Denmark exported 207,513 head of cattle, and Canada exported from 1870 to 1873, 233,402 head of cattle, or about 26,000 more than Denmark. I will now give you the figures showing the results for the last four years for which we have reports. From 1881 to 1884, Denmark, instead of 69,838,730 pounds of butter, exported 133,061,193 pounds, or nearly double the quantity for the former period. Canada, from 1882 to 1885, exported only 38,674,611 pounds of butter, or very little more than half the quantity she exported in the four years from 1870 to 1873. On the other hand, Denmark, for the last four years for which we have had the figures, exported 445,498 head of cattle, or more than double the number she exported during the former period, while Canada, for the last four years, exported only 360,771 head. To sum up these figures, Denmark has doubled her butter exports and has more than doubled her cattle exports, while Canada is exporting little more than half the butter she formerly exported, and has increased her cattle exportation by about one half. This shows that dairy farming in every branch will enable the farmer to have more stock on his place, to keep better stock, to sell them for better prices, and to make more money from his farming operations all round—cows and steers included. The total exports of Denmark for the sixteen years, from 1869 to 1884 inclusive, amounted to 433,492,488 pounds, while the exports of butter from Canada, between 1870 and 1885 inclusive, were 212,593,246 pounds. The total exports of cattle from Denmark during that sixteen year period, were 1,401,918 head, as against 914,462 head from Canada. This shows that general stock raising and general farming are perfectly compatible with first-class success at dairying; and hereafter let no man in Canada say that he cannot afford to go into dairying, or that dairying is to be opposed because it interferes with the exportation of beef.

Mr. HOARD.—Did you inspect the character of the cattle?

Mr. ROBERTSON.—Yes, I will deal with that by-and-by. Let me say before passing on to that point, that the appearance of the country from the railway cars impressed me

most favourably. Without hesitation, I say that it appears to be the best cultivated country that I have ever travelled in. After passing from Canada to England, of course, as might be expected, I was satisfied that the English system of farming was one which made the country look better than ours ; but I found nearly as much difference in passing from England to Denmark as I did in going from Canada to England. The fields were well tilled and thoroughly clean ; the ploughed fields were ploughed so well that I could see no trace of vegetation on the top of the furrows. Besides, the country did not seem to favour those fence corner ornaments which are admired so much or at least are so often to be seen in Canada. They keep the fence corners, wherever they have fence corners, quite free from weeds. Another thing I noticed was that the fields were cultivated to the edges of the ditches, and the latter did not wear that border fringe of weeds and other vegetation that is so often to be seen in Canada. All this means that they have a very thorough cultivation of the fields ; their fields had a finished appearance, which led me to conclude that one effect of being engaged in dairy farming was to make a man more careful in administering all his farm operations, more thorough in his methods, more economical and consequently more comfortable. I have a good deal of admiration for the sentiments which were expressed this afternoon by our friend from Wisconsin. The administration of a farm is a most important part of the education of a farmer, and particularly if he is engaged in dairying. I think that the Danish growers of sugar have to thank the dairymen for making the sugar-beets grow so well in that country, because it led to their keeping their farms so clean and so well cultivated. I will give you the ordinary method of farming there, and I will first give you the rotation of crops which they follow. Their eight-course rotation is :—Wheat, sugar-beets, barley, beans peas and turnips, oats, clover to cut, pasture. Their four-course rotation is :—Wheat, roots, barley, half clover and half beans. Now, let me say a word with regard to dairying proper, and how they manage it. The general breed of cows in that country are those called the Langels, from the province of Angeln. In appearance they are somewhat like the Jerseys, and also something like the Ayrshires, and if I had met them in Ontario I would have taken them as a cross between those breeds ; the neck and head are somewhat like the Jersey, while the body is more like that of the Ayrshire. The attempt to trace them to a Jersey origin, has, I believe, been unsuccessful, and I think their appearance is simply due to a constant process of treating and feeding and breeding these animals for the economical production of milk. They produce milk in large quantity and of good quality, and I believe that on that account they have come gradually to resemble the type of the Ayrshires and Jerseys. The quantity that they yield may be put down at 6,700 pounds per annum, or 6,000 Danish *punds*; that is about the average yield of good herds. When I found that that was the average yield, it did not startle me very much, because I knew that they could not make dairy farming so profitable as it is, unless their cows gave a large quantity of milk ; but it led me to further investigate the question of whether it were not possible for Canadians to get their cows to produce as good results. I have come to the conclusion that it is quite possible for Canadians to reach that standard if they treat their cows as well as the Danes treat theirs. I say this, but at the same time I certainly would not recommend the importation of the Langel cows into Ontario. The practice in the past has been that as soon as a cow of a certain breed was discovered to give a large flow of milk, all the agricultural papers and lecturers set out to prove that because one cow of that particular breed gave a large yield per annum, that was the breed for Canada, and no other breed would do. I think that is a rather narrow view of the question for dairymen to adopt. I repeat that I do not advocate the importation of the Langel cows to Canada, but I would recommend that common Canadian cows should get as good treatment as the Langel cows, and if they do I believe they would give an equally good account of themselves. As dairymen we have to face the competition of Denmark in the butter markets. Perhaps at the present moment a discussion of that question would not be so interesting here as if the members of this body were more largely composed of butter-makers than they are ; but I am satisfied that we will soon have to face the competition of Denmark in the cheese markets of the world as well ; because I learn from the authorities there, that at present they are very much interested in learning how Canada has succeeded in making so fine a quality of cheese, and I should not be surprised if we had two or three Danes coming out

here this summer endeavouring to do in Canada as we were trying to do in Denmark. Though I believe we have no reason to fear the competition of the Danes, or for that matter, any other cheese-makers in the world, yet we have to face the prospect that the Danes will be formidable competitors when they take up cheese-making, in the same way as they have taken up butter-making. Should they do so, with their cows giving 6,700 pounds of milk per annum, while ours give less than 3,000 pounds, it means that they would be able to sell their cheese at half the price of ours and be able to make a profit, while we would sell at a loss. We have a more excellent way of placing ourselves ahead or abreast of the Danes than by importing the Langel cows, and that is, by so feeding our own cows as to encourage them to do their very best. On that point I begin by saying that the breed of the cow is not worth half so much to the cow as most farmers consider it to be. I have a good deal of faith in and respect for the individual qualities of a well-bred cow, but the qualities of that cow that are valuable, are merely those which enable the animal to successfully and profitably change a given amount of food into a given amount of product, in the shape of milk, or butter, or cheese. That quality in the animal must be created by her owner complying with those conditions which would make it possible in the first place, and by a continuous compliance with those conditions, so that those qualities become fixed qualities. If those conditions be complied with in an individual case, the value of heredity, as a principle, is not very high, unless the environment and conditions of the stable to the animal are maintained continuously. For my part, I would rather have an animal which came from a scrub, but was well reared during the first six months of its life, and well housed and fed during the next six months, for a milking cow or a fattening steer, than I would one that was from a thoroughbred cow, but which was badly reared the first six months and badly kept and housed for the next six months of its life, and badly cared for for the next year. Breed is worth a good deal, but it is only half the battle; feed and care win in the other half. We can make good cows by good feeding as well as by good breeding. This is an important point, and let us begin with the time of calving, and with the selection of the best calves. That brings me to the discussion of the subject so ably presented by Mr. Hoard this afternoon, and that is, the proper rearing of calves. On that subject I would merely give my fullest approval to all that Mr. Hoard has recommended; his experience quite agrees with my own, and it has been of longer duration, and has extended over a wider area, and is, perhaps, on those accounts more valuable. I do not find that sour food or cold milk is a suitable food for the calf's stomach. Sour milk is worth rather more by the pailful than sour whey is by the half pailful; and sour whey is worth as much by the half pailful as water is by the quart, and by that simple calculation you can arrive at the value of sour milk as a food for calves. It may do, as Mr. Hoard said, as a food for developing plenty of belly and long hair, but it is good for little else. I remember two calves trying an experiment on their own account, for the purpose of ascertaining how well they would do on sour whey. At first they swelled out to about twice as large as their natural size in an hour or two, but there were no more experiments carried on with those calves for my benefit or the benefit of anybody else; the only good they were afterwards was to produce grass on top of their graves. With regard to feeding calves, let us say that it is quite possible to feed a calf after it is six weeks old somewhat too often. I agree with what Mr. Hoard advocated with regard to feeding the milk warm, and feeding it often up to a certain limit, but I do not know that it is advisable to feed the calf oftener than three times a day until it is three weeks old, or oftener than twice a day after it is six weeks old. I found it a convenient way of feeding calves to make small divisions or stalls against the fence, each division just wide enough to hold one calf, and then putting the food through a small opening, so that the calf could get up to the stall and drink its allowance. Their was no chance of the stronger ones getting more than their share, or the weaker ones less than their share. Under the ordinary plan the largest are apt to drink so much as to do them harm, while the smaller ones do not get enough to do them good. I have found that early calves are generally better as feeders and milkers than late calves, and if a calf is neglected during the early months of its existence, I hold that it is impossible to make up the loss afterwards. The digestive organs of the calf are very delicate when it is young, and if injured by improper food or a

want of care at that time it is very difficult during the next year or year and a-half to bring its system back to a healthful state, so that in its after life it will be apt to be unfitted for the work of transforming feed into milk. It is handicapped through all its existence by the bad treatment it has received in its early history. That brings me to the question of the best time to have cows calve, and that leads to the larger question of winter dairying which was discussed this afternoon. I consider that every cow should be milked for ten months in the year. Now, in Canada what ten months in the year are those during which it is most profitable for us to have our cows milking? I think it is possible to produce milk at a profit during the winter months, but are those the months when it is most profitable for us to have our cows milk? I do not think so, especially in those sections where cheese factories are patronized by dairy farmers. However, I leave that part of the question just now; I may say a few words on this point. Granting it to be possible to produce milk in winter profitably, how can we best do it, because every farmer must produce some milk in winter if his cows are to give milk for ten months in the year. The first point undoubtedly is, the feed of the cow. If the cow be improperly or insufficiently fed, or excessively fed during the earlier period, the profits will disappear. The question for dairy farmers to be informed upon is, how to feed a cow enough and not more than enough to make her profitable. The feed itself should be suitable for the encouragement of the secretion of milk. Let me give you the ration which is supplied to the cows by the Danes:—Three pounds of bran, two pounds of oil-cake, five pounds of oats and barley mixed, seven pounds of clover hay and thirty of mangels. That is the quantity which is usually fed to each cow per day. I have found that some grain or some bran will make a cow give far more milk of as good quality than all grain and no bran, and bran is cheaper per pound. I have invariably found that a certain quantity of oil-cake will enable the animals to do much better with their other feed; and as I have said, the Danes feed two pounds of oil-cake per day. I am not at the moment able to state the specific feeding value of that quantity of oil-cake. They also feed five pounds of a mixture of oats and barley, properly chopped and thoroughly mixed. They find that that is a better combination for milk purposes than any other they have tried.

Q.—Do they feed peas?

Mr. Robertson.—They feed peas for fattening, but not for milk. In this part of the Danish ration I see the possibility of Canadians disposing profitably of their barley when, as is sometimes the case, it is inferior in colour, and does not bring a good price. It might, I think, profitably be changed into milk. Then the Danes give seven pounds of clover hay per day. The Canadians feed about three times as much hay as that, but it is usually timothy instead of clover, and I know from the experience of farmers who feed green cut clover hay that it will give a larger yield of milk than timothy hay. I have known myself four pounds of an increase of milk per cow per day result from the change. I think all hay should be cut rather on the green side, for ten pounds cut in that way are worth more than twenty-five pounds of timothy which is allowed to ripen too much in the fields before being cut. With regard to feeding cows straw, I think it is just possible to feed straw economically and profitably if it is prepared in the best way. And I think that Canadian farmers lose largely by allowing the straw to become too ripe. I have noticed, besides, that when the straw is allowed to become too ripe there is a loss of the grain, and the grain itself does not look so well afterwards. Crops which are cut on the green side show the plumpest sample and the brightest colour. Thus while there is no sacrifice in cutting grain on the green side, there is a great gain in the feeding value of the straw. Then the Danes feed in addition to what I have stated thirty pounds of mangels. It appears to me the Canadian farmers have been in the habit of feeding too many roots to milch cows. The Danes have experimented largely and carefully on this question of feed, and they find that an excessive supply of roots weakens the cow, and does not give so large a flow of milk, and they have arrived at thirty pounds as the maximum quantity of that kind of food. It is not uncommon for Canadian farmers to feed a bushel or a bushel and a-half, and that quantity involves a direct loss in the waste of roots as well as in the injury of the animal. This ration, the Danes say, has been combined for the purposes of encouraging a large flow of milk, and they find that any-

variation in the relative quantities will not produce as good results. The point which is sought to be attained by the Danish method of feeding cows is to get the cow into the habit of changing her food into milk and not into something else, and unless the proper ration is kept up it is found that the cow does not regain the habit to the same extent, even when she is put, say, on an abundance of grass. I think Canadian farmers, if they observe closely, will find the same thing, and that if a cow has not proper attention in the way of suitable spring feeding in the stable she will not come up to her proper standard throughout the following summer. The unrecognized habit of the cow in devoting part of her food to profitless waste is one which entails very severe loss on the farmer. I find also that the Danes have given their cows abundance of food—just as much as they can take, but never more than they need. I think that considerable injury is inflicted by the habit of leaving food before the animals all day long. Their appetites are not so good, and the appetite has a good deal to do with the digestion. The careful dairyman finds that removing the surplus food from before the cow is an economical practice, and that the cow returns to her next meal with a sharper appetite. I will not discuss the question of how Canadians should mix the food they give their cows, but I certainly think it is better to mix the richer foods with the coarser than to give them separately. I think there is great benefit in having a milch cow feel thoroughly satisfied once a day —not merely satisfied to the extent of getting a certain allowance, but fully filled up once a day. That tends, if the food is of the proper kind, to promote rumination and digestion. The Danes supply their cows with sufficient food at all seasons of the year, and that is a point on which Canadians might learn something. While Canadian pastures supply abundance of food from about the middle of May to the middle of July, there is often a scarcity in the latter part of summer. The pastures become dryer and barer, and they find that the milk supply drops very perceptibly at that time. This is mainly owing, I believe, to their neglecting to supply their cows with supplementary food when the pastures fail. Every dairyman should have a fall plot of green feed for this purpose, and he will find that it will keep up his milk supply, and thus prevent the loss which happens under the other practice. I have found by experimenting that encouraging the cow in this way to give more milk by an addition of green food does not injure the quality of the milk, though I had formerly been under the impression that the increased flow produced by the large quantity of succulent food was not of so good a quality. I found, however, that the very contrary was my experience, and it is confirmed by what Mr. Hoard has said, that an abundance of proper food would not only increase the quantity of the milk, but improve the quality as well. Every farmer has the satisfaction of knowing when he makes his cows give all the milk they can by proper food that he is thereby improving the general quality of the milk, and consequently the general quality of the cheese at the factory which he patronizes. Another advantage which is gained from the giving of the supplementary food is that a difference will be noticed immediately in a largely increased secretion of milk; and I have no doubt that by giving cows an extra supply in this way the quantity of milk produced would increase by as much as four pounds per head per day on the average, but if this extra supply be continued it will be found that by the end of a week or so the yield will fall back nearly to where it was before, even while continuing the supplementary feed. In other words, say that a cow is giving twenty pounds of milk per day on ordinary pasture, and you give her this extra feed, it will enable her to give twenty-four pounds the first day after receiving it, but by continuing to give the extra amount of food the milk supply will drop back to about twenty-one pounds by the end of the week. It is quite possible by changing the kind of food frequently to keep the supply up to the maximum instead of its falling back. Such a system of changing the food should be practiced by every dairyman for the purpose of keeping up as large a flow of milk as possible. It will be found that by using a little honest and judicious trickery of this sort in dealing with their cows they will respond at once to the great advantage of their owners. I think our dairymen, instead of assigning say fifteen acres of pasture field for six or eight cows, and allowing them to roam over the whole of it to get their food, cropping it bare and injuring the roots so that the pasture does not grow so well, would find it a better practice to divide a large field like that into, say, three sections; even by changing the cows from one to the other

they would be stimulated at each change to do their best in the way of an increased supply of milk. That is the kind of honest trickery which dairymen should practice, as it will result in a profit to themselves without loss to anybody else. I find also that the watering of cows has a good deal to do with the milk yield, and it should receive a great deal more attention than it does, especially in the spring. For the last ten days I have been out attending farmers' institutes, and meetings like this, and have had many opportunities of seeing how the farmers water their cows. I have seen a great many cases in which they were watered at an opening in the ice, and even in cases where the water was pure, it was so cold that the cows were liable to become thoroughly chilled, and the result invariably is to lessen the supply of milk. By doing so a bad habit is established, so that the cow, instead of using her food to transform into milk has to apply it for the purpose of heating. No milking cow should be required to warm the water she drank from thirty-two degrees to ninety-eight degrees by her food. I think that, ordinarily, cold spring or well water should be run into the stables where the cows could have access to it, and though it may be objected to this method that it prevents the cows from having a certain amount of exercise, I can assure you that such exercise on a cold winter's day does not tend to promote the secretion or the yield of milk. By turning out cows in the winter time they have been known to fall off in the milk supply 15 per cent., and you will find no injury sustained by cows being properly housed during the whole period of inclement weather. This is a matter to which I feel convinced that the farmers of this country do not give sufficient attention, and I am quite confident, as a result of a rather wide experience in the matter, that if a cow is housed in a very cold stable all winter, or if she is allowed to become chilled by drinking water in the way I have described, she will give a less quantity of milk on a given quantity of food all summer in consequence. It is by their close attention to these details that the Danes have been enabled to get their cows to yield six or seven thousand pounds of milk per annum, and it is by neglecting them that so many of our cows do not attain a higher yield than 3,000 pounds. However, passing on to another question of winter dairying I would like to discuss one point, and that is how we could best dispose of this winter milk. Now, if private butter making was the occupation of a dairy farmer I would recommend the adoption of winter dairying in its entirety, because the higher prices obtained would leave more profit; the cheaper labour available would also increase the profits, and so would the fact of his having proper stabling and other conveniences for carrying on the work. But I do not think it is desirable to encourage private dairy farming in Canada to a large extent, and the question is, is it possible to make dairying profitable at creameries in the winter?

Prof. ARNOLD.—Do the Danes make their butter in private dairies or in factories?

Prof. ROBERTSON.—They make butter by both systems, but even in private dairies the number of cows they keep runs all the way from 80 to 250 per herd, so that the private dairy is in the condition of having a large quantity of milk, and turns out the choicest kind of milk to be found in the whole kingdom.

Mr. HOARD.—Do the cows usually calve in spring or in fall?

Prof. ROBERTSON.—They prefer to have them come in from early in December until about the middle of January. It seems to me that there are difficulties in the way of making winter dairying in Canada practical or profitable. First, there is the difficulty of bad roads—a serious difficulty in the way of co-operative dairying in the winter season. It may be possible to produce the milk at a profit, and it is desirable to produce it as early as February. The further question is: Is it possible under the circumstances in which we usually find the Canadian farmer to make co-operative dairying profitable as a whole, so early in the season? Would it not be found to be rather impracticable? On the other hand, I think the Canadian farmer might well have his cows come in, say in February, use the milk in the way that has been already suggested, and get the best kind of calves to increase his stock. He would thus have a good supply of dairy butter for the use of his family all summer and for town use in our own country. I think that system would pay very well, as the farmer instead of keeping his cows at a loss in Feb-

ruary or March would make them pay for their keep in addition to all the other advantages of that system. Now, to pass on—perhaps not very logically, but still necessarily—to the treatment of the cow for summer dairying, let me again insist on the farmer keeping no more cows than he has abundance of food for. Then, in regard to the watering of cows, too much care cannot be taken to have the water perfectly pure. A great deal of injury is caused by cows drinking impure and stagnant water. Such water usually is full of certain kinds of organisms which pass unchanged through the cow's stomach ; they appear in the milk, multiply rapidly, and then they develop in the cheese. The result is to give it a very bad flavour. I am quite certain that the wretchedly bad character of some cheese is entirely due to this cause, and no doubt many dairymen here have noticed that occasional stray batches of cheese have a very bad flavour which they cannot account for. I have had examples of that kind myself in factories, where a few batches had the worst kind of garlicky flavour, and I could not account for it on any other theory than that some of these peculiar organisms were taken up in the water, found their way through the cow's system and appeared in the milk, causing an injurious fermentation, and utterly spoiling the character of the cheese. The salting of the cows is another matter of great importance and one upon which there has been a good deal of discussion. As the value or the necessity of salt for milking cows was disputed, I made some experiments with twelve cows for the express purpose of trying to discover the value of salt. The twelve cows were divided into groups. I first removed all salt from the fields, lanes or yards ; I had all the salt the cows could take put before some of them, leaving none accessible to those that formed the other groups. The first result was that the cows from which the salt was withheld gave about 20 per cent. less milk than they had formerly been giving, and that reduced yield of milk was continued. This, however, was not conclusive. It was possible that some other influence was at work. Then I let those cows which in the first test had received no salt for a week have access to all the salt they wished, and withdrew the salt from some of the others. The result was that those receiving the salt gained in milk to some extent immediately thereafter. These latter cows deprived of salt fell off nearly 20 per cent. during the next few days. I did not rest there, but carried the experiment a little further to make it conclusive, and without troubling you with the details I may just say that I am quite confident that the withdrawal of salt from milking cows lessens the yield of milk. The actual immediate average loss in milk yield due to the withholding of salt was $17\frac{1}{2}$ per cent., while the average loss during the whole period of irregular salting (three weeks) was $14\frac{1}{2}$ per cent. The cows having access to salt regularly during the same time and pasturing in the same fields, and in every other respect being treated as those referred to, maintained their yield of milk at a steady average for the three weeks. Now, the lessening of the yield of milk by $14\frac{1}{2}$ per cent. is a most important matter, especially when we consider that if the yield be lessened at any time during the milking period it is almost impossible to bring the cow up to the former standard. If the supply of salt be forgotten or overlooked for, say a week, the injury sustained by the cow during that week will be likely to affect her throughout the whole season. With regard to these two points of watering and salting cows, I feel quite sure that if our dairymen paid strict attention to them they would be able to increase the milk yield of their cows at least 30 per cent. on the same quantity of food. I may say that I had occasion to test to some extent the quality of the milk with regard to the supply of salt, but the test was not by any means exhaustive. I had no conveniences for testing it as to its value for cheese-making, and we were able to discover no appreciable differences in the butter made from the milk of those cows that had salt supplied them, and the milk that came from the others. I should say, however, that the butter is now at the college in Guelph, and that I had no opportunity of tasting it since a short time after it was made.

Mr. Hoard.—Did you discover any difference in the flavour ?

Prof. Robertson —Yes, there was a great difference in the flavour of the milk.

Mr. Hoard.—But how about the flavour of the butter ?

Prof. Robertson.—I could not detect any difference at that particular time, although there may be a difference now. I found that the milk from the cows which had received

no salt, soured in twenty-four hours less time—or about that period—than the milk from the cows which had received the salt, both being kept at a temperature of 40° to 48° Fahr., and afterwards raised to about 65° Fahr. I believe that a good deal of the milk which comes to cheese factories in a sour condition is sour not because of the weather, as is generally supposed, but because the cows have not sufficient salt, and I frequently found that the cream had not nearly so fine a taste, nor had the milk so full a flavour in the case of those cows which were not receiving salt. Being anxious to make my conclusions as reliable as possible, I invited all the visitors who came to the creamery for a day or two, to taste the samples of these milks without telling them how they were obtained, and the invariable verdict was that the milk from the cows which were receiving salt tasted much better than the other samples. I had intended to carry on the experiment further, for the purpose of showing the length of time required for each sample to ferment, but my trip to England looming up just at that time, I was not able to make my experiments as conclusive as I wished, by means of analysis. I may say that the conclusions that I arrived at were these: that the withdrawal of the salt lessened the milk yield, and made the milk very much inferior for cheese purposes. The yield of cream by bulk was about equal from both qualities of milk. I was anxious to discover the truth in another direction, and that was to find just how much salt a cow should receive—what quantity she would actually take if she had access to all she required; because some farmers have told me that if cows had access to salt whenever they chose to take it, they would be apt to take too much. The experiments I made in this direction showed that on an average a cow consumed a quarter of a pound of salt each day, and that consumption was kept up as long as the experiment lasted. Before this I had had a little controversy as to whether rock salt or granulated salt should be supplied to milking cows, the ordinary practice being to leave a lump of rock salt in the yard where cows could have access to it. I did not believe that that was sufficient for the cow, and I am now convinced that it is not. When salting is done in that way, the cow's tongue is satisfied long before her system has received sufficient to make her milk yield as large as it should be, and I am satisfied that that method of salting lessens the yield of milk. I thought besides that, even if a cow was able to take sufficient supply in that way, her time might be better occupied than standing all forenoon licking four ounces of salt from a large lump. With regard to the milking of cows, I found that in Denmark they are extremely careful to have their cows milked very regularly. They attend to the milking of their cows at the same hour every morning and evening, and they find that any variation immediately produces the effect of lessening the flow of milk. Here I would like to impress this lesson on our dairymen—that any irregularity of this kind, even for only one day, not only lessens the flow of milk for that day, but its effects are felt to some extent on the animal during the whole milking season. The Danish dairymaids milk twenty cows each in about two hours time each morning and evening; I do not know whether their cows are more easily milked than ours, but they certainly do not complain of finding any difficulty in milking that number of cows. I am rather inclined to think that their cows being properly fed, properly housed and treated in every way, the milking operation is a much less difficult one than if the cows were insufficiently fed or improperly cared for in other respects. I think the very fact of a cow's regularly having a full secretion of milk renders the withdrawal of the milk somewhat easier. Of course there is a difference in practice between Denmark and Ontario in one respect, because in the former the dairymaids do all the milking, while it is a pretty general practice in this province for the men to do it. The Danes think that women are better adapted to this work than men, and better adapted to dairy work generally. There is perhaps one advantage in having dairymaids who are constantly engaged in milking, and that is that they become experienced, and treat the cows more quietly and patiently, which undoubtedly promotes an increased secretion of milk, and an increased flow of milk.

Mr. Hoard.—I may mention that a Danish friend of mine says that his people find that women are much more successful in promoting the secretion of milk, because being quieter and gentler than men usually are, secretion is promoted, and it is supposed that a large portion of this process of secretion goes on during the operation of milking.

Prof. Robertson.—I have no doubt there is something in that; in fact, I believe that the process of secretion very largely goes on during the actual process of milking. I have given that subject some thought, and I am convinced that, at any rate, the completion of the act of secretion is nearly all accomplished during the milking process. The fluids may be partially changed into milk before that time, but I should judge that the finishing touches, so to speak, are given when the cow is being milked, and that kindness and gentleness of treatment and handling enable the cow to do her work better. We often feel like blaming the cow if she does not allow herself to be easily milked, when the truth is that being in a nervous condition while the operation is going on, she can no more let down her milk than a nervous man can make a speech to an audience, no matter how much material he may have in his mind. As this is a convention of cheese-makers rather than of butter-makers, I will not enter so fully into the practices in Danish butter-making, which have made it so successful; but I will only say that if Canadian farmers, who make a quantity of butter for their own consumption, or for sale, would use a better quality of salt than they have been in the habit of using, they would make their butter worth at least three cents a pound more than it is worth to-day in England, and would considerably increase its price even for our own home market. The use of a coarse-grained salt, which is difficult of solution, is one which tends to impair the quality of butter very much. The Danes use a salt which will dissolve in about one hour, so that when added to the butter the second working can be performed within one hour with the salt thoroughly dissolved. When a coarse-grained salt is employed, it will often be found undissolved three months after the butter is made, and this is a practice which is very profitless and wasteful to the dairyman, and would continue to be so, even if he could get such salt for nothing, or have a bonus given along with it. Fine salt should be used in every case, and I believe the Canadian salt makers this year will produce a quality of salt which is both fine in grain and readily soluble. This summer I got a sample of Canadian salt and had it analyzed, and I found it to be a very fine sample, and one that can be dissolved in one hour. I shall shortly finish the investigation we are making into this question of different salts, but I feel satisfied that in future Canadian farmers and dairymen will be supplied with a quality of salt which will be all that could be desired. There are some other matters in connection with Danish butter-making that I intended to say a few words upon, but I may perhaps have an opportunity of doing so to-morrow.

Mr. Leitch.—How is land held in Denmark? Is it held under tenancy, or in fee simple?

Prof. Robertson.—Generally in fee simple. The large estates are generally in farms of 600 or 700 acres, on which they keep upwards of 250 cows, and then there are smaller farms having perhaps ten to twenty-five cows, supplying milk to creameries which are mostly carried on now under the centrifugal separator system, though a few of them are carried on under the old system. The general practice, however, is for the small farmers to supply their milk to creameries, while the large ones make their own butter.

Mr. Hoard.—How many cows do they carry to the acre under the soiling system?

Prof. Robertson.—I endeavoured to find that out, but was never able to ascertain how many cows they could keep per acre if their land was all devoted to dairy purposes, instead of being devoted also to the raising of sugar-beets and other kinds of farming. Baron Tesdorpf, a large farmer there, has a home estate of 1,600 acres, of which about 800 acres were cleared, and on those 800 acres he kept 250 cows. The remainder I may mention was in forest, the trees being properly cared for by a forester. Those cows were kept on the soiling system; they were allowed to be out only one month in the year, some keeping them out in June and others in August.

Mr. Casswell.—Do the Danes favour the ensilage system?

Prof. Robertson.—I found that they were not very much in favour of ensilage. The cows in pasture are generally tethered within a given area, and are so arranged that a man can pass between the rows with a watering cart, thereby promoting an increased secretion and a larger yield of milk.

Mr. LEITCH.—Do the common people of Denmark eat much butter?

Prof. ROBERTSON.—They use about four and a half times as much per head as they do in England, and very fine butter it is.

Mr. LEITCH.—What is the population of the country?

Prof. ROBERTSON.—It is something under two millions, and the area nearly nine millions of acres. I may add that if the figures which I gave about the exports of Danish and of Canadian butter show a large difference in favour of Denmark by the pound, it would be largely increased in favour of Denmark by the area of the land. The area of Denmark, I believe, is not more than about one-seventh of the area of the occupied part of the province of Ontario.

Mr. BLUE.—It is 14,771 square miles.

Prof. ROBERTSON.—At any rate, it is a country much smaller than Ontario. I may say that I saw nothing in Denmark to induce me to believe that Canadians are unable to make just as fine butter as the Danes. I think we have every resource in the way of cattle, climate, the skill of our people, and so on, and that if we utilize these in the same way that the Danes have utilized their resources, it would be quite possible for Canadians to make as fine butter as the Danes do, and to get as high a price for it in England, and thereby gain for our butter as good a reputation in England as we have already gained for our cheese.

The PRESIDENT.—Perhaps the Professor would tell us something of the Danish method of salting butter—how much salt they put in and so on.

Prof. ROBERTSON.—They put in about four per cent. of salt, which would be equal to less than three-quarters of an ounce per pound of butter.

Mr. HOARD.—Do they put the salt in as brine?

Prof. ROBERTSON.—No. I may mention that they add their salt by measure instead of by weight, which I think is a good idea, and for this reason, that a pound of wet salt has not the same salting properties as a pound of dry salt, while a given measure of wet salt will be about the same in that respect as the same quantity by measure of dry salt. I think if the Canadian cheese-maker were to put in his salt by measure instead of by weight he would find greater uniformity in the product.

The PRESIDENT.—What is the usual quantity of salt put in at the creameries?

Prof. ROBERTSON.—It has been about one ounce per pound in the past, but I think they are now putting less than that. At the Colonial Exhibition we had some butter with only a quarter of an ounce per pound, which found favour with the merchants in London, though English country buyers did not like it. During the summer one ounce of fine salt per pound of butter would be right. Rather less might be used after July.

Mr. MACPHERSON.—What is the quality of Danish cheese?

Prof. ROBERTSON.—The Danes make very little cheese, and I found it almost invariably of very inferior quality. I put my strongest trier into one to try it and I had some difficulty in getting it out again. The cheese was so hard that I got the trier twisted in withdrawing it.

Mr. LYNCH (Danville, Que.)—Is it not the practice in Denmark to work the butter without the use of water?

Prof. ROBERTSON.—Yes, I found that to be the practice, but, like a good many other practices I saw there, I would not recommend its adoption in this country. I think in many respects Canadians can congratulate themselves upon being ahead of the Danish dairymen. Our methods and conveniences for making and handling butter are in many respects superior to those of the Danes.

Mr. CASSWELL.—Do you think that we have equal facilities for making the same quality of butter—butter that will bring the same price in the old country—with those they have in Denmark?

Prof. Robertson.—I think so. I think that in Canada we could make as fine a butter in the month of June as they can make in Denmark; I think that we could pack that butter and store it for some months, and have it reach England in December in as good condition as Danish butter.

Mr. Lynch.—I would like to refer for a moment to the question which has been raised of increasing temporarily the supply of milk by increased feeding, and then its falling off. I think one important factor has not been touched upon, and that is the necessity for a gradual change. I believe that the falling off is due in many cases to the fact that there is too sudden a change in the feeding; and that if the change was gradually made, if there was a gradual leading up to increased feed, as long as the increase was continued the greater yield would also continue. With regard to winter dairying, while the exceptions which were taken to it from a cheese-maker's point of view may hold good, it does seem to me that the remarks that were made by Mr. Hoard, with regard to the desirability of doing something in the way of winter dairying, would apply to at least a great part of Canada. We cannot, of course, adopt co-operative winter dairying at once, because it involves so much of a change, but if some of our farmers were to take it up on a moderate scale, it seems to me that they would always be able to find a ready market and good prices for the butter they make; they would be able to find such a market at their own doors if they made a good quality of butter. This would help to relieve the market of the large amount of butter which is now made in summer and kept over till winter, much of it in anything but a good condition. So long as the farmers continue to make a poor quality of butter in summer, and keep it over till winter, and so long as we continue to consume that kind of butter, we will find that the total consumption will be less than it should be.

The President.—I am sure we are all very much indebted to Prof. Robertson for his able and instructive address. I noticed during its delivery that it was listened to with the greatest possible attention, notwithstanding the fact that the majority of those present are cheese-makers, for though he dealt particularly with butter dairying, he referred to many matters connected with the management of stock, the handling of milk, and so on, which are of special interest to cheese-makers. The evening is too far advanced for these matters to be discussed to-night, but no doubt they will come up to-morrow for full discussion. Prof. Robertson has made several experiments this year in connection with cheese-making, this Association having voted a sum of money to enable him to pay for the milk for the purpose of these experiments, as there was none in connection with the College. The cheese with which these experiments were made, is here to be examined and tested, so as to bring out the best method of manipulation in regard to salts, rennets and other matters which constitute the principles of cheese-making. It has been suggested that you should name a committee for the purpose of examining this cheese to-morrow morning, so that the results of the experiment may be brought before the convention, and I would now ask you to name that committee.

Mr. Cleverdon moved, seconded by Mr. John Craig, that the following gentlemen constitute the committee:—Messrs. Macpherson, Casswell, Podmore, Prof. Robertson and the President. The motion was carried.

Nominating Committee.

The President.—It is the rule to appoint at this session of the convention, a committee to nominate the officers of the Association for the ensuing year, that committee to report to-morrow afternoon at two o'clock.

On motion the following were appointed as the nominating committee:—Messrs. William Symington, John Fulton, J. B. Lane, Christian Schragg, W. K. Clarke, Hugh McCartney and Thomas Grieve.

At 10.45 p.m. the convention adjourned till 9.30 Thursday morning.

SECOND DAY.—MORNING SESSION.

The Convention resumed at 9.30 a.m., the President in the chair.

The President then introduced Prof. L. B. Arnold, of Rochester, N. Y., who read a lengthy paper, giving an account of the proceedings of the annual conference of the British Dairy Farmers' Association, held in June of last year, together with observations on dairying in England. Countries devoting special attention to the dairy industry were invited to send delegates to this conference, and Prof. Arnold was the representative of the United States. Following are extracts from his paper :

DAIRYING IN ENGLAND.

Upon entering the Conference, I was disappointed in finding that neither Denmark nor Germany was to be represented at its sessions. Drs. Segelckè and Fjord, of Denmark, and Dr. Fleischmann, of Germany, had been invited, but professional duties prevented their attending.

France was represented. by Prof. Lezé, editor of "L'Industrie Laitiére," of Paris, and principal of an agricultural school in the east of France, and by the French Consul at Manchester.

From outside of England there were present delegates from Scotland, Ireland, Wales, Holland, Australia and Cape Colony.

The Association is composed of highly intelligent dairy farmers and experts, with several learned dairy professors, abroad as well as in their own country, and other distinguished friends of the dairy. There are about 300 members. These, with the attendance from outside, constituted the ablest collection of dairy talent and learning that had ever assembled in the kingdom, and made the Conference the best one ever held by the Association.

The British Dairy Farmers' Association was organized about ten years ago and modeled after the late American Dairymen's Association, but differs from its American prototype in that its members are mostly composed of dairy farmers and milk producers, the American and its successors being made up mostly of manufacturers. Their papers and discussions differed from ours in being directed almost entirely to the production and disposal of milk. During the four days' time occupied by the Conference, there was but one short essay devoted to manufacture, and that was presented by a lady. The labours of the Association tend to educate its members in the direction of milk production and to find their greatest profit in reducing the cost of its production to a minimum, rather than in improved manufacture, while the burden of our public discussions is chiefly directed to the art of manufacture. The field which most engages the attention of the British Association is, I am sure, the field of greatest promise, and is one which, it is quite evident, competition will compel us to enter more fully into in the future, whatever we may do in regard to manufacture. The dairyman who produces costly milk will be doomed to fall behind in the race, no matter what use he makes of it, or however skillfully he may dispose of it.

The earnest attention and close figuring which English dairymen bestow upon the cost of producing milk, interested me very much. It was not only a leading feature in the discussions at the Conference, but it prevailed in every part of the kingdom that I visited. The attention given to this subject generally, and the special effect from the labours of the Dairy Association have tended so much to educate English dairymen in the direction of economical milk production, that they are clearly leading us, as a nation, in that important particular. We, on the other hand, by our special attention to the science and art of manufacture, are, and for some years have been, leaving them in the rear in that accomplishment.

The opening essay at the Conference treated of milk production, and its consideration lingered in every day's proceedings. Robert E. Turnbull, the essayist, is one of England's

best dairymen and had at some time, as I understood, been the recipient of a prize for the best managed dairy farm in England. Mr. Turnbull points out that the annual income of a 1,400 pounds five-year-old shorthorn cow is $150, consisting of 800 imperial gallons of milk, at an average of 7½d. a gallon—equal to $125, as pounds are usually converted into dollars, with $12.50 for a thoroughbred calf and $12 50 for manure. The debits amount to $135, including keeping, rent, interest on investment, taxes, rates and labour—the labour being about one-third of the expense. It may be noticed that he makes the cost of keeping $135 and the value of the milk $125—$10 less than the cost. Were it not for the calf and manure the cow would bring the owner in debt. In the discussions which followed, his figures were pretty sharply criticised. His reply was that they were based upon actual experience—and that he had the facts on record which he would willingly show any one who felt interest enough to examine them. The cost for feed was $91.25, and of labour and other charges, $43.75, making a total of $135.00.

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As already intimated, the average English dairyman does some things better than his American cousin and he has some advantages not enjoyed by the latter. The Englishman feeds more evenly than the American. His cows are given a good ration every day in the year. This enables them to hold the flow of milk without an unnatural and unnecessary shrinkage, till they dry up naturally by distance from the time of coming in. There is no losing half the mess for half of the season by starvation, or, to put it more mildly by scanting the feed for a month or so when the season is but half gone. I travelled nearly a month in England, and talked with dairymen wherever I went, but I failed to meet a single one who, if a drought should occur at any time in the season had not some green crop, or feed of some kind, to fall back on, to prevent his cows from shrinking. As compared with this country, long droughts seldom occur in England. Yet should drought scant the grazing at any time, no dairyman thought he could afford to allow his cows to be pinched, even for a short period. It is not with them as it too often is with us, feed to the knees in May and June and nothing but bare, brown pasture in August, while half filled bags the rest of the milking season cut off the profits of the whole year. We have some of the best if not the best feeders in the world ; but we have also some of the poorest. I consider it a virtue in English feeding that it is so nearly uniform.

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Lord Vernon, the President of the British Dairy Farmers' Association, is a large and enthusiastic dairyman. Upon visiting his country seat I found it the site of the Sudbury Dairy School, the first one established in England. He had also a Cheddar cheese factory, a Stilton cheese factory, and a butter factory, containing three centrifugal cream separators. He was handling the milk of his tenants, some 60 in number, and receiving daily about 40,000 pounds of milk.

From his position and the large interest involved, it was anticipated that everything connected with the dairy would be about as good as it could be, and the results of his operations were observed with special interest. The 60 cows upon the place were, of course, all shorthorns, and showed to be fairly good milkers. Thirty selected cows had just been under a course of experimentation from February 3rd to May 19th, for determining, as nearly as possible, the lowest cost in feed at which good milk could be produced. The facts and figures developed in the experiment gave a clew to the possibilities of the herd, and were otherwise instructive. For such an occasion it may be assumed that cows in good condition for milk would be selected. The average weight of the 30 cows was 1,150 pounds, and remained nearly constant during the trial. The daily yield of milk per cow at the beginning was 27 pounds, and at the close 24 pounds, with a total of dry solids a shade below 12½ per cent. The quality of milk was good enough to make a pound of butter from 27 pounds, and a pound of cured cheese from 10 4-5 pounds. Without giving further particulars it will be sufficient to state that his lordship had been giving his cows more food than they could utilize, and that it was possible, in Eng-

land, with a dairy of stall-fed shorthorns, to produce milk at a cost in feed of $1 per hundred pounds, the feed being estimated at the price at which it could be purchased in the markets at wholesale.

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Among the circumstances which favour dairying in England are the excellent facilities for marketing dairy products. England is dotted all over with large cities and villages at short distances from each other, thus filling the country with consumers rather than producers. The demands of the former are more than the latter can supply, leaving always a margin to be filled by importation. As home products are naturally preferred to foreign ones, especially dairy products, there is never any accumulation of English dairy goods. They always go on the market fresh and in their best condition, and consequently at good rates. There is no keeping butter from June till January for a better price, nor is there any necessity for delay in marketing on account of hot weather. The climate is cool enough at any time to send butter the short distance necessary to reach a market. thus a good price and ready market being always at hand contribute efficiently to success. A very large per cent. of the milk of England is sold as milk for direct consumption, at a price which makes it more profitable than growing grain. Mr. Turnbull, before quoted, said in his essay that it cost £7 to grow a ton of grain (2,240 lbs., or 37 bushels of wheat). This can be grown on an acre of good ground, and several parties with whom I talked upon the subject made similar estimates, but generally put the cost at a dollar a bushel for wheat. The same ground that will grow a ton of grain at £7 will produce a ton of milk at a cost of £6, making $5 difference in the cost. A ton of milk now sells at the farm for as much, taking the average of the year, as the best of grain sells for carried to market. Hence there is a general leaning from grain toward milk. Those who are so situated that they cannot sell their milk, make it into butter or cheese, and though they do not generally realize as much as milk sells for near the cities, they still do better than if growing grain.

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I spent a day in the Cork butter market, where I had the privilege of sampling 1,800 packages. I tested enough to get a good idea of its merits. Much of it was very choice, but no inconsiderable share was over-worked, over-salted, and over-watered. It was the only place I found where I thought water was systematically worked in to increase weight. So far as I could learn, butter in Ireland is always worked to relieve it of buttermilk and never washed. The reason assigned was that there was no water suitable to wash it with. Another peculiarity said to exist in Irish dairying is that cheese is nowhere made on the island. I saw nothing of cheese-making in the Glassnevin Dairy School, on the model farm near Cork, though it had every appliance for making butter; and it was said not to be made at the Munster School, near Dublin.

I did not have time to visit the Irish creameries. nor an opportunity to sample their butter, which I very much regretted, for I was assured by those who knew, that they were operated with superior skill, and turned out butter of great excellence and uniformity.

The associated system of dairying appeared to be making much greater progress than in England.

Why the butter should be better in Ireland than in England, was a problem. I saw nothing in the soil or climate, or in the manufacture of the great bulk of the butter that should make it in any way superior to that on the adjacent isle. The soil seemed less fertile in Ireland and the water was against it. The dairy schools have their influence, but the cause antedates them. There seemed to be nothing left but the breed of cattle to which it could be referred. The Kerry cows which abound in Ireland, and other small cattle common to the country, which seemed to be of no particular breed, all gave rich and delicious milk as compared with the poorer, paler, and less decided flavoured milk of the more ponderous shorthorns.

I spent three days in Shropshire, on the border of Wales, in riding around among the farmers. The cattle I saw there corroborate the view I had taken of the cause of differ-

ence between Irish and English butter. They were small and apparently of no particular breed, and were largely mixed with the small black cattle of Wales. The cows were excellent milkers, and the milk made butter with more flavour and colour than the milk in the Midland counties, where there were little else than shorthorns. A pound of cheese, too, was made with about half a pound less milk, the cheese bringing the highest price of any that I saw or heard of—65 shillings a hundred for cheese made in May and early June. All these observations together gave me a favourable impression of the milking qualities of the smaller cattle, though inferior in appearance and as meat producers.

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Most of the cheese in store was either from the States or Canada. The latter took the lead both in price and quality, and was generally recognized by the dealers and consumers as the better cheese. In pricing cheese at Hodgeson Bros., Liverpool, the highest was Canadian cheese from near Ingersoll, held at 50 shillings. The next was English Cheddar at 44 shillings, not first rate, and lower grades, which included State cheese, running from 42s. down to 12s., the latter being Canadian skims. This was the poorest cheese I saw. State cheese was offered at about 40s. It was objected to our cheese that while it early became ripe and mellow (mealy would have been a more appropriate term), it did not develop fine flavour like the Canadian cheese, and that it got off sooner, and when it began to fail it went down swiftly. Similar remarks were made about it in London, but the cheese from our side, I am sure, was more uniform than the Canadian, the latter being quite variable.

I have spoken of our cheese as it appeared in the English markets, and as it was estimated by dealers and talked about by consumers. But I do not regard the estimation in which our cheese is held in England, as compared with Canadian, as a fair representation of the merits of the make in the two countries. There is a much larger quantity of cheese made in Canada in proportion to the population than in the United States. We make about five pounds per capita, and Canada nearly or quite 20. Canadians consume but a small share of what they make, and send their best make abroad. We consume the great bulk of ours and select the best and export chiefly the lower grades. We have a great many well-to-do people in our large population, who are willing to pay more for a fine article than it will bring for export. We shall continue to labour under this disadvantage in comparison until the great bulk of our cheese approximates the best.

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Referring to a sample lot of American butter found in London warehouses, the essayist said :—

" There were no distinguishing marks on the tubs to indicate whose make it was, or where it came from, but judging from the style of the package, it was from the West. The tubs held about sixty to sixty-five pounds; they were of hardwood, with soft wood covers, and looked new and bright. Upon removing the covers and the muslin from the top to try the butter, the contents of the tubs looked clean and apparently well preserved. As is too common with our butter, its deep artificial dyeing was too high to appear natural even for June, and served to advertise its American origin. It was too high to be well appreciated by English consumers as well as English dealers. A lower and more natural colour of good butter is preferred by them, as it is by butter fanciers generally. The butter had evidently been packed at a temperature considerably above that to which it had afterwards been exposed, and in cooling had shrunk away from the staves, leaving a space between the butter and the side of the tub, giving an unnecessary exposure to the air. By running a flat trier, resembling a flat file, down between the tub and the butter, the butter adhering to the trier showed a bad condition. The tubs had not been more than half soaked, and before separating from the staves, the butter had absorbed so much sap and flavour from the wood as to badly demoralize it to the depth of an inch to an inch and a-half all around the sides in every tub. The soft wood in the covers had not been deodorized at all, and though not appearing to have much odour, and not at all in contact with the butter, yet the scent of the wood had penetrated the whole surface of

the butter under it in every tub, from a third to a-half an inch deep, causing serious injury, of course. When a half-round trier was thrust into the centre of the tub, it brought out a trier full of as nice looking butter as one often sees. It was as sound as a nut, and as sweet and aromatic as a rose. The texture was good enough to be called perfect, and with forty as the measure of perfection, the flavour would have scored thirty-eight or thirty-nine. But there was still another discount on its saleable value in London. It was salted an ounce to the pound, which is twice as much as the better class of English consumers prefer. Seeing from its condition in the middle of the tubs what a choice article this butter was when first churned, and what a wretched condition it was in when opened, I could not help lamenting the misfortune, and appreciating how much easier it was to spoil good butter than it was to make it. The importer valued the butter at sixteen cents a pound—a price which, perhaps, would not more than cover the cost of its production. Its firm and solid texture, and its full and peculiar flavour, could not have come from grass alone, even in early June. They were evidently the product of grain-fed cows, and it is not at all uncommon, where much grain is fed, to have the cost in feed alone for the milk for a pound of butter to equal, or even to exceed, sixteen cents. It would not be very likely to cost less, making all the labour and expense involved in converting the milk into butter and marketing it, a total loss to somebody.

Had this butter been seasoned with half the salt, and coloured with half the dye it contained, and had the package been properly prepared, it would readily have brought ten cents a pound more than was asked for it, and its real value would have been that much greater. It was clear to me that from not knowing how to prepare packages for butter, and from not knowing what would suit the consumers to whom it was offered, either the creamery manager or his patrons sunk $200 on every ton of butter sent abroad in that condition. The loss was absolute. There was no good in it for anybody.

I could not help thinking, as I looked upon the injured goods, how much good it would have done the maker if he could have been there and seen his half prepared packages opened, and been an eye-witness to the mischief his ignorance, or negligence, had done. And when I saw how different the colouring and seasoning were from what Europeans desire, I appreciated how important it was for manufacturers of dairy products to know where their goods are going, and to study the tastes of the customers to whom they are offered.

It is worse than a barren waste of time for dairymen to try to extend an export trade without a better knowledge of what is wanted abroad, and how to fit the goods for the journey they must make.

Had this butter stopped in Chicago, where its high colour and saltness would have been acceptable, and gone at once into consumption, before there was time for it to take injury from the tubs, it would have sold for eight cents a pound more than it brought in London. Seeing how much better this would have been, I felt like encouraging a home instead of a foreign market, and like discouraging the holding of butter at any time.

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The great bulk of the cheese is, therefore, made in private families, and is consequently very uneven, and much of it poor, though some of it is as fine as cheese can well be made. If cheese in England should be made on the associated plan, to the extent it is in the United States and Canada, the advantage of combining, and the advantage in natural conditions together, would soon put English cheese so far in advance of what it now is, that we should be compelled to improve our make materially to be able to compete with it.

The PRESIDENT.—As the reading of this paper has occupied more time than we expected, probably it will be as well to defer discussion upon it until after we have heard Mr. Macpherson's paper on the subject of the principles of cheese-making. These subjects are more or less related to one another, so that the discussion may very well be deferred until we have heard Mr. Macpherson's paper.

The following paper was then read by Mr. D. M. Macpherson, of Lancaster, Ontario.

PRINCIPLES OF CHEESE-MAKING AND SYSTEM IN THE AGENTS EMPLOYED.

The subject of cheese-making is one which has been, to a large extent, enveloped in mystery and uncertainty, as the active agents are obscure though certain in their effects.

They are influenced by air, temperature, composition of the ingredients of milk, and the length of time in each of the manipulations of milk and curd.

Cheese made from pure milk is a compound substance, composed principally of butter, caseine and moisture, in nearly equal proportions, and when we consider the main influences which the rennet, air and temperature have on these three principal ingredients and on the different processes which they undergo, it is no wonder that so many different results are experienced by cheese-makers and cheese-dealers.

This may be clearly illustrated by a three-wheeled combination lock, which is capable of producing one million changes, when carefully and minutely worked; the lock has only three wheels or composite parts, yet by a slight change of position of the first wheel on the second, the second on the third, and the first and second combined on the third, a marvellous number of changes is obtained.

In a similar manner, curd obtained from milk being composed of three main parts, caseine, butter and moisture, the slightest change of the character of the caseine combined with the butter, and the butter with the moisture, will produce as many changes as the three-wheeled combination lock.

As all these million changes of a combination lock can be repeated continuously with accuracy time and again, so can the changes produced in cheese be repeated, with the same accuracy, when the science of cheese-making is thoroughly understood and minute formulæ obtained to produce these results.

Every cheese made has a formula of its own and can be repeated by that formula with perfect accuracy.

The hidden active principles of cheese-making are as certain in their effect as the laws of nature in all the universe.

Such being the case, what scientific cheese-makers have to do is first to discover the several agents that work these changes, then establish a rule by which these agents may be controlled in all their different forms of action; then, and not till then, will the results be certain and reliable.

As cheese-making has not been made the subject of scientific and close researches, as it ought to have been, nor even of thorough experiment repeated and repeated to establish results, it is no wonder the science has been slow and unsatisfactory in its development.

Men of learning have had only their theoretical principles to guide them, and men of practice have had but little learning to assist them in their observatien of experiments and the result has been that the science of cheese-making presents a profusion of technical terms, indefinite in their meaning and deceptive in their practical application.

In endeavouring to present to you an intelligent paper on the principles of cheese-making, you will, no doubt, appreciate the difficulties with which I have to contend, when you consider the mysteries yet unfolded, and also the fact that some of the principal active agents are not yet properly named and possibly not yet discovered.

The imperfections and inaccuracies to which I may be liable, will leave room for and possibly stimulate discussion on these points.

After eighteen years of practical experience, many experiments, careful observation and comparisons of results, I have come to the conclusion, so far as my observation and research go, that the principal active agents in cheese-making are only two, namely, rennet action and fermentation, and these are influenced by two main conditions—temperature and consistence of the milk and curd.

The rennet seems to be the agent that acts on the caseine of milk to solidify the structure, hold the cream globules mechanically in suspension, contract the parts up to a cer-

tain degree of consistency by expelling moisture or whey, then acting on all the parts of the remaining fluids and solids in assimilation.

Fermentation is of two kinds—lactic and putrefactive—either of which is the natural spontaneous change which milk undergoes after being taken from the cows. Putrefactive ferment is that which produces decay and generates noxious gases. The lactic fermentation seems to act on the sugar of milk from germs received from exposure to the air, so as to change this sugar to an acid, thereby changing dead matter into a living organism and transforming the natural decay of a dead body into a self-preserving existence.

The kind of lactic fermentation depends on the consistency of the curd and its temperature, which either produce a union of moisture, caseine and butter, or disintegration of these parts; hence the great importance of controlling in exact proportions the consistency of the curd, by way of moisture, and the temperature best suited to produce the highest results possible of attainment.

If a cheese, showing an assimilation of all its parts with a certain consistency or body, has the greatest demand, and commands the highest price when offered for sale, then by all means control these conditions as above described.

If a cheese, showing disintegration of its parts—that is, containing free moisture, caseine insoluble, brittle and crumbly, the butter held encased in the cream globules perfectly intact, the flavour of which is sour, bitter and insipid, its texture grainy and loose —if this class of cheese commands more money, then by all means control these conditions for obtaining such results.

But such is not to be desired. We want a cheese that has a certain per cent. of moisture, which is about 33 to 35 per cent, and this moisture assimilated with the caseine and butter, so as to show a smooth, solid, firm buttery body, in pressing between the thumb and finger, and having a sweet nutty flavour.

The means to be adopted, to produce such results are what all good cheese-makers desire to obtain.

The experiments I have carried on during the past season, go far to prove that the main agents to produce these results are rennet, and a certain class or form of lactic fermentation, developed at a temperature of between 90° and 98°, small in quantity in the milk and largely increased in the firm curd. I shall term this lactation acid or assimilating acid. The action or development of lactic acid under this temperature in considerable quantity in the milk, and soft curd, having a tendency to separate the parts of curd, I shall term disintegrating acid.

I shall here devote some time to explaining these principles as well as I can, so as to make my remarks intelligible, as I am now treading on new ground, and not sufficiently versed in chemistry to represent the different forms of chemical reaction which take place at these different temperatures. Suffice it to say, that I shall strive to make myself understood by phrases commonly used among cheese-makers.

Let me here suggest the advisability of a series of standard terms to be used in cheese-making, carefully defined so as to be easily understood by the ordinary cheese-maker in his every-day work: and also that some expressions be dropped out entirely, as having no meaning and no bearing on the work of cheese-making.

One of these latter terms is "cooking the curd."

This expression, in its literal meaning, has no part or bearing in any of the processes of cheese-making, and if literally carried out by the cheese-maker, would be disastrous to good results.

No particle of curd should be heated above 98°, which cannot be considered "cooking."

The reason we heat to 98° is to stimulate the rennet action in expelling eighty-three parts of the whey out of eighty-seven, which is free moisture, and also to generate a certain amount and kind of fermentation so as to assist the rennet in assimilating the remaining moisture with the caseine and butter.

If cheese-makers left the curd in the whey until the curd was "cooked" during the spring and hot summer, with the class of milk that many factories receive during this period, I venture to say that more than one-half of the cheese would be largely spoiled,

and its value much reduced. Hence the term "cooking of the curd" is misleading and should not be used.

I have found many young cheese-makers very much misled, and by using it in its literal sense, they have spoiled much of their cheese.

I would here suggest the adoption of the following terms, with their definitions to be a standard for future instructions to cheese-makers. These could be changed in any way, added to, or taken from, modified by this Convention, or a committee appointed for such purpose. My aim is to systematize the work of the cheese-maker so as to obtain a formula to produce any desired result, and this formula to be so easy of comprehension that an ordinary cheese-maker can easily apply it :—

Rennet Action.—This is the thickening or curdling of the milk, expelling the surplus moisture ; it continues throughout the whole process of curing and is the main agent to compound and assimilate the constituents of cheese when not opposed in excess by lactic acid in the milk and soft curd.

Fermentation Action is the spontaneous changes which milk undergoes after being taken from the cow, and is of two kinds—*a*, putrefactive and *b*, lactic : (*a*) putrefactive ferment is that which produces decay and generates gases ; (*b*) lactic ferment is the changing of the sugar of milk into acid ; it is opposed to putrefactive action, and neutralizes the generation of offensive gases arising therefrom.

Assimilating Acid or "Lactation" is the modification of the lactic ferment generated in the milk and firm curd, so as to produce an amount of lactic acid, sufficient to prevent excessive putrefaction and formation of gases, and not sufficient to produce disintegration of the constituents of curd or cheese.

Disintegration is the result of excessive action of lactic acid on the curd, which is caused by excessive moisture contained in the curd.

Moisture in the Curd is the remaining whey held in the constitution of the curd.

Firming the Curd.—This is substituted for "cooking the curd." It is the expulsion of a sufficient proportion of moisture from or out of the curd.

Hot Iron Test.—This is that condition of the curd (commonly supposed to be caused by the lactic acid formation) when a small quantity of the curd is pressed in the hand and made as dry and warm as possible ; then touched to a medium hot iron and then slowly drawn away ; the length of the fine thread-like parts which attach themselves to the curd and the hot iron determines the amount of acid in the curd.

First Stages of Lactic Acid.—This is when the curd first begins to draw out on the hot iron into fine threads a sixteenth of an inch long ; it is also known to skilled cheese-makers by the taste of the whey and the flavour of the curd.

Porous Curd is the formation of putrefactive gases inside the particles of curd which can not escape out of the curd, and thereby produce a cavity.

Drawing the Whey Sweet.—This is the removing of excessive whey immediately before the curd strings a sixteenth of an inch on the hot iron test.

Aerating is exposing the milk and curd to the action of the air.

Healing the Surface of the Curd is the forming of a pellicle or rind on the surface of the curd for the purpose of holding the cream globules after the curd is broken, and acts as a strainer to allow the clear whey to pass out without carrying off the cream.

Heating the Curd is the application of heat after breaking the curd fine and the healing of the surface has been accomplished.

Hand Stirring of the Curd.—This is the stirring of the curd after the whey is drawn, for the purpose of hardening the curd or aerating it.

Packing the Curd.—This is the piling up of the curd so as to form it into a solid mass.

Grinding the Curd.—This is the breaking or cutting of the curd into suitable fine particles after being packed, which process is done either by hand or machine.

Salting the Curd.—This is when salt is being applied.

Hooping the Curd.—This is when the curd is being put to press in the hoops.

Pressing the Cheese.—This is the application of power to shape and mould the cheese in the hoop.

Dressing the Cheese.—This is the trimming off all rough edges, laying down the bandage in form and washing off all soiled spots on the outside of the cheese, preparatory to taking it to the curing-room.

Curing the Cheese.—This is the care and attention of the cheese in the factory cheese-room and the structural change it undergoes while there.

The principle of lactation or assimilating acid above defined is one of the most important in the whole process of cheese-making and seems to have escaped the observation of practical and scientific men and all writers on this subject.

The necessity of thoroughly airing the warm new milk has always been admitted, but the exact effect of the action of the air on the milk in the subsequent processes of cheese-making has never been thoroughly explained.

In this exposure to the air, the warm fluid becomes, to a certain extent, oxidized and thereby prepared for the production of lactic acid in the chemical reactions which take place when the milk is being treated in the vat.

The production of lactic acid is not accidental but essential to the process; its necessity being due to the need which arises for the preservation of the curd from the over action of putrefactive ferment.

The opposing action of the lactic acid overcomes the putrefactive fermentation and prevents the formation of those gases which are so destructive to the quality, firmness and flavour of the cheese. By its influence, also, the three constituent parts are brought together into closer affinity with rennet action, giving to the product that fine, silky, consistent, buttery appearance and solid body which cheese buyers seek for and consumers demand.

The application of the hot iron test, immediately shows to the cheese-maker the necessity, if such exists, for controlling or lessening the formation of this acid principle; when the curd begins to draw out in threads from the hot iron, if a superabundance of moisture is apparent in its consistency, it becomes necessary to artificially assist the rennet in expelling the superfluous moisture from it.

This is done by drawing the whey at once and stirring the curd with the hands until a sufficiently firm consistency is obtained; this consistency is indicated by the curd creaking under the teeth, forming a solid mass when pressed in the hand and feeling firm to the touch. If the precaution is not taken to expel this superfluous moisture, too much of the lactic acid principle is formed and a disintegration of the particles takes place, which is extremely injurious to the quality of the product, as is shown by a sour leaky cheese.

It is unnecessary for me to enlarge on the importance of turning out a uniformly first-class article from our factories.

It is possible for us to do so, and to attain this end I would advocate the issuing by this convention, or by government, through the institution which it so judiciously supports (I refer to the Agricultural College at Guelph) of a cheese-makers' manual, which could be universally adopted.

This work I have attempted to perform myself, by compiling a small manual for my own operations the past year, and the gratifying results which have followed my weak efforts in this direction indicate to some extent the grand benefits which would accrue from a more comprehensive and accurate work, compiled in the manner I have suggested, and donated to the cheese-makers of our province.

Mr. Leitch.—I am much gratified with the papers we have heard read this morning, and especially with that of Prof. Arnold. I believe there is not a dairyman in Canada but feels grateful to Prof. Arnold for his labours on behalf of dairying and dairymen

in this country. I think we should also be grateful to gentlemen like Prof. Robertson and Mr. Macpherson for the work they are doing on behalf of the dairy interest in Canada. There is one thing, however, as to which I should like to get some information from these gentlemen. I am one of the old settlers in West Middlesex, and in the early days we used to allow our hogs to run in the bush where they ate the beechnuts and acorns. But when we came to get the pork which was made of this kind of food we found that it was not of good quality; it was very soft, and it all ran to gravy, as the old women used to say. These gentlemen have forgotten one thing, and that is, the food of the cow; for I believe that it is impossible for any cheese-maker to make good cheese unless his cows are supplied with the right kind of food. Different kinds of soil produce different kinds of grasses, and these have their effects on the product. For instance, in my own factory, I have to instruct my cheese-maker to be very careful as to the quantity of moisture he puts in the cheese, as I find that the grass in that particular locality has a tendency to make the cheese too dry. In another township, on the other hand, there is an excess of moisture. Now, what is the reason of this? I believe the reason is simply in the grass which the cows get to eat. In my own neighborhood the land is a sandy loam, and I have to depend a great deal on clover. It is a well known fact that red clover is a very valuable feed for cows in the summer time, but it undoubtedly has a tendency to make dry cheese; while on the heavy clay soil, where you find blue grass, white clover, timothy, etc., the tendency is to make the cheese with more moisture in it. Cheese-makers finding these peculiarities in the quality of their cheese, are unable to deal with it satisfactorily, unless they find out what the peculiarity of each locality is. The first thing that we as dairymen have to procure is a suitable kind of grass which will produce the proper butter or cheese. The next thing is to have good cows. I believe we have the cows, but I don't believe we have the grasses, or rather, I do not think that we know the effect of the several grasses in the production of milk and cheese, and that is really the proper foundation to work upon. If we are to make as good a cheese as they make in England, we must find out the best sorts of grasses adapted to that purpose, and we must use them. I hope that Prof. Arnold and Mr. Macpherson will give us what information they can on that subject, for I am always willing to learn, and I believe that is the general feeling of cheese-makers. This is a subject which I do not think has been investigated by naturalists or scientific men as much as it deserves. We find naturalists going all over the country and publishing whole volumes about the habits and peculiarities of bugs and other insects, but how many are there who know the exact effect of these different grasses in the production of milk and cheese? How many of them could tell you what quality of milk you will get if you feed on timothy alone, or on blue grass, or white clover, or any of the other grasses or clovers? How many of them could tell you what combination would be the best for the purpose of producing a high quality of cheese or butter? It is related by Mr. Harris that one time he had a patch of white clover which he allowed to grow until it was in full bloom. Like many others he had a high estimation of white clover as a food, so he turned in his cows with the expectation of having a fine quality of butter. But he found on the contrary, that after the milk had been churned the butter was very poor and frothy, so that white clover immediately fell fifty per cent. in his estimation. If he had had before him the results of careful experiments with white clover he would not have made the mistake he did, and I think that is one point in which we are behind, and it is the very foundation of our industry. I hope that at the Agricultural College they will sow patches of the different kinds of grasses separately, and experiment with them in the feeding of cows, with a view of determining their comparative value in butter and cheese production. It is true that Prof. Brown has been making experiments by sowing a large number of different varieties in combination, making what is called a permanent pasture, which would appear to be very valuable; but there are so many different kinds of seed combined that we really do not know their relative value. We have some idea of the feeding value of oats, peas, corn, rye and other grains, when taken separately. Scientific gentlemen will give you the exact feeding value of each, but we do not know the relative feeding value of ten pounds of blue grass, ten pounds of clover, or the same quantity of any other of the numerous grasses. This is a point on which I think we should have more exact information, because, after all, grass is the cheapest feed we have in this

country for making either beef or milk ; and here, where land is cheap, we want to know the value of the different grasses, and which will make the best article. (Applause).

The PRESIDENT.—I would suggest to Mr. Macpherson that he should give us a description of his process, divesting it of all technical terms, so that it may be easily understood. I think in that way he would make his address all the more valuable.

Mr. MACPHERSON.—I entirely agree with the last speaker as to the importance of the feed which the cow receives. That, however, comes under another head, namely, the production of milk. No doubt the quality of the cheese depends largely upon the quality of the milk, but still we find in practical experience that very poor cheese is often made from the best of milk, and for that reason it is necessary that cheese-makers should have a thorough understanding of the active agents which they have to control in order to produce the best results. For instance, I believe that the action of air on milk is a very important agent, and one that we have been neglecting too much. If you have an animal odour in the milk, air is the best agent to get rid of it by oxidization, so that the proper ferments will be carried out. From my experience I believe that what we might call the lactic fermentation, developed at say from ninety-five to ninety-eight degrees in milk, is much different from the fermentation developed at ninety degrees. I think, if you look back to your own experience, you will find that if you cool your curd down to between eighty and ninety degrees you will never make as fine a cheese as if you kept it up to ninety-five or ninety-eight degrees. I keep the temperature up to ninety-eight degrees as nearly as possible, from the time we draw the whey off. We draw the whey sweet ; the cheese-maker is required to use the iron test, and if it is soft we draw it earlier in order to give time to expel the moisture. I approve of adding the rennet at as low a temperature as possible, as I have found by some experiments that I could make a clearer whey with the temperature at from eighty to eighty-four, than from eighty-four to ninety. In all cases the object is, of course, to develop fermentation, and the object of applying the rennet at a low temperature, is merely to secure the cream in the curd. I tested it very carefully, and I found that we could not retain the cream on the inside of the particles of curd by setting it at ninety-eight degrees, and hence we had to reduce the temperature so as to have a solid coagulation at a lower temperature, and the cream globules are thereby h ld in the inside of the curd. Of course, if we could retain it at ninety-eight degrees we should by all means keep it at that temperature ; but we have no method of securing a pure, clear whey by setting it at ninety-eight degeees, and hence I believe in setting it at a lower temperature and gradually raising it. A proper system of agitation is very important. We make it a rule that all the particles of curd must be kept moving while the h at is being applied in the vat, the proper movement being from the bottom upwards going down one side but not the other.

The PRESIDENT.—Would you cut it as evenly as possible?

Mr. MACPHERSON.—Yes, though everything depends on the condition of the milk. If the milk has been taken in in the heat of summer and is old, when there is a large proportion of lactic acid, the curd must be broken up fine by using the knives double. I think the better plan is for factories to have two sets of knives—one three-eighths and another five-eighths, using the finer one in the heat of summer when the milk is old. When the milk is in perfect condition the coarser knives would answer better, as the coarser you cut the curd the better, because more cream is held in the inside of the curd and there is less lost in the whey by cutting it coarse than by cutting it fine. But the point is, that we must use every means to obtain the right quality, and even if we do lose a little by cutting fine, it is imperative on us to do so, in order to obtain cheese of the highest condition and quality. Then the heating is one of the most important parts of cheese-making, and a great deal depends on the proper motion of the curds while the heat is being applied. The curd being heavier than the whey, will settle down into a mass unless it is properly stirred, thus forming a new surface and losing some of the cream. Though the motion at first should be very gentle until it is healed over, it will afterwards be an advantage to handle it with considerable roughness. I find it is very hard to stir it too much ; in fact I would prefer having it over-stirred than under-stirred, because if not sufficiently stirred the cream passes off from the curd and the quality of the cheese is

injured. Uniform action during the heating process is very important, as otherwise a putrefactive ferment is apt to set in, and an injurious flavour will be imparted to the cheese. After the heating process is over I would advise that the curd be stirred up every now and then. When you stir the curd and let the whey stand then the fine particles of the curd settle first, while the larger particles, which are the lighter, come to the top; hence if you examine the feel of the curd settling in whey you will find that all the hard curd is in the bottom and the soft mushy curd is on the top. This shows the necessity of stirring it occasionally so as to mix it, and so that an opportunity may be given for the expulsion of the moisture from the soft curd. The whey separates the particles of the curd like a sieve into large and small, the small going to the bottom and the large to the top. We draw the whey just before the change takes place, and if the curd is soft, we draw it a little earlier and hand stir it.

Mr. FACEY.—Do you ever remove, say three-quarters of all the whey at one time, and then apply the salt to the remaining portion to expel the moisture, instead of doing it by hand stirring?

Mr. MACPHERSON.—No, I never tried that. I find that you can accomplish as much by hand stirring in five minutes as you can in fifty by allowing it to stand in the whey.

Mr. FACEY.—If you apply one-half a pailful to the vat at that particular time, you will not delay two minutes in incorporating it, and then you will find that you can handle the curd with as much ease as though it had remained in the whey half an hour or three-quarters longer. I have done it in that way for years with the best results.

Mr. MACPHERSON.—I see no difficulty in hardening the curds when the whey is on.

Mr. HOARD.—What objection have you to getting rid of almost all your whey, leaving only barely enough to float your curd—getting rid of that amongst the earlier processes of working the curd?

Mr. MACPHERSON.—I find that the first whey that comes from the curd seems to be more injurious to it than the last.

The PRESIDENT.—But what objection have you to drawing off the whey as soon as possible, and leaving merely sufficient to float the curd?

Mr. MACPHERSON.—The object is to control the temperature of the curd.

The PRESIDENT.—He was assuming that you did not draw any whey until it was all ready to draw together.

Mr. MACPHERSON.—Oh, no; I find the best results from drawing off the bulk of the whey as early as possible.

Mr. HOARD.—Don't you think there is another effect? For instance, you are working milk that has fermented, and that you have to work quickly; there is a trace of taint in it. Don't you think you augment that trace of taint if you allow the whey to remain in contact with the curd, and that by getting rid of the whey as early as possible, you avoid a certain percentage of danger?

Mr. MACPHERSON.—I have often found that an objectionable quality of cheese is caused by the whey being drawn too sweet off the curd.

The PRESIDENT.—What do you call too sweet?

Mr. MACPHERSON.—When there is not any apparent acid, and the whey is not sufficiently expelled.

Mr. ROBERTSON.—Is not that due to the state of the whey?

Mr. MACPHERSON.—I think it is the whey that is affected.

Mr. HOARD.—Do you handle the whey subsequently just the same?

Mr. MACPHERSON.—We do not handle it at all that way. I have had makers who had the idea that it was necessary to draw the whey perfectly sweet, and they have injured a good deal of cheese in that way.

Mr. LEITCH.—If you get the curd cut in the vat, how long do you allow the process of heating to continue? Suppose it is at a temperature of 84 or 85, how long do you take to heat it up to 98?

Mr. MACPHERSON.—From thirty minutes to an hour, according to the condition of the milk; if it is perfectly sweet we take a little longer, and if it is working fast we hurry it up.

Mr. HOARD.—That is the point I want to get at. My experience has been that that whey has to be handled entirely differently. I can make fine cheese by drawing the whey sweet if I handle it differently. Almost every condition connected with this question is a law to itself, and the point is to discover each condition.

Mr. MACPHERSON.—The principle is that we must overcome the putrefactive ferment in some form—if not in the milk, then in the curd, and if we overcome it in the dry curd it takes much longer.

Mr. HOARD.—Is not that what might more clearly be called a process of slow development? Won't the cheese keep longer under a slow process of development?

Mr. MACPHERSON.—I think it depends more on the amount of rennet.

Mr. HOARD.—That is another point; but what I want to know about is this constantly slow work. Is it your experience that the cheese keeps best when it is worked quickly, when, say you have it all cleaned up and got to press at twelve o'clock, than if you worked it more slowly?

Mr. MACPHERSON.—My experience is, that properly matured curd takes from five to six hours after the whey is out.

Mr. HOARD.—Have you had any particular experience in handling the cheese for some time after it is made?

The PRESIDENT.—Have you seen it, for instance, three, or four, or six months after?

Mr. MACPHERSON.—No, that is not my experience.

Mr. HOARD.—The difficulty is that we do not know anything about the child that has been born; we deal with it for a few weeks, but afterwards we know nothing about it, and do not acknowledge its paternity.

The PRESIDENT.—We will be able, to some extent, hereafter to solve that difficulty. Prof. Robertson has been conducting some experiments during the past season regarding the quantity of rennet, the different quantities of salt, and other points of that kind. The cheese with which he has been making these experiments has been examined from time to time, and it was examined this morning, so that we will soon be able to have its history, and the results of the experiments as we find them to-day. Prof. Robertson will give an account of his experiments at the afternoon meeting, and as it will be specially interesting, I hope you will all be present.

Mr. MACPHERSON.—I do not want to be misunderstood by this convention. The stages of sweetness can only be determined by the hot iron test as a starting point, and it is an infallible guide. The expression, "drawing the whey sweet," is very deceptive, because it gives no starting point. I think the professional gentlemen present will confirm my position—that is, that that expression is very deceptive, because, as we know, there is acid in the milk from the beginning.

Mr. HOARD.—As I understand, that is not the normal condition of milk. For instance, I have tried thousands of samples of milk with litmus paper, and though occasionally I might find a quantity of milk, drawn fresh from the cow, which would show a discoloration of the paper, that would only occur in a very few instances. I would hardly be willing to take as the basis of our manipulation, that milk was in a state of acidity when fresh drawn.

Mr. MACPHERSON.—The question is, does litmus paper give us an exact test. The point is that we cannot determine when the acid begins, and we must have some determining point.

Prof. Arnold.—It is a common occurrence that milk, when it is first drawn from the cow, will show a little reaction with the litmus paper, to indicate acidity. That, however, does not come from the milk itself, but from the carbonic acid gas which is formed in the udder of the cow, and comes out with the milk, and discolours the paper. But if you try the milk with the paper within an hour, or perhaps within fifteen minutes after it is drawn, if it has been stirred in the meantime, you will find an entirely neutral reaction on the litmus paper. Milk itself is not acid, and when this foreign gas has escaped it is entirely neutral, and remains so until some change afterwards is developed, so as to change the sugar in the milk so far as to make an impression on the litmus paper. It cannot change very much without the paper showing it. After you have added the rennet, and caused a separation of the whey, this gas is all the time forming in the milk; you do not see it coming in the form of bubbles to the surface, because it does not form gas enough for that. But it is coming up all the time in imperceptible points like air; and there is enough of that to show on the litmus paper while the whey is still sweet, the sugar not yet having changed to acid. By-and-by, however, it begins to change, and though you may not be able to detect it by the taste at first, it gradually develops so that you can discover it in that way. The sugar gives it a sweet flavour, and we call it sweet; and, notwithstanding Mr. Macpherson's definition, it is sweet, and tastes sweet. After a while we say it is sour, because we can taste the acid by the tongue, but it was sour before that. After a time it begins to act chemically on the constituents of the curd, and to change them. When it has got to that stage we have difficulty, as Mr. Macpherson says, in getting the taint out of the milk; it makes a change, which is an undesirable one. He is perfectly right in saying that these changes should go on while the curd is sweet. For that reason I have always advocated of late years the removal of the whey from the curd while it is perceptibly sweet, though it may not be so under a litmus paper test. The term, drawing the curd sweet, is, as Mr. Macpherson says, a misnomer in a comparative sense, but we have to use it in order that the cheese-maker may apprehend our meaning. He goes by the senses, and we must use language of that kind, though strictly speaking, or scientifically speaking, it may not be true.

Mr. Casswell.—I would like Mr. Facey to tell Mr. Hoard how the curd was drawn in the cheese to which Mr. Hoard has made reference, and which he says is still very perfect. We know that it went to Wisconsin, where it made a very favourable showing, reaching the highest points, except in two instances.

Mr. Facey.—The cheese to which Mr. Hoard has reference was drawn perceptibly sweet as we would call it, and we manipulated it by keeping the heat up until it was ready to go to press—probably four hours after drawing the whey. We salted about two and a-half pounds to 100 of curd, and kept it in an even temperature at between 70 and 80 degrees.

The President.—When were they made?

Mr. Facey.—In October.

Mr. Macpherson.—What time in October?

Mr. Facey.—I could not tell you that.

Mr. Hoard.—That is a year ago last October.

Mr. Facey.—Yes. I may say that I left the curd at from 80 to 90 degrees for between three and four hours before going to press.

Mr. Hoard.—How long did you allow the acid to develop before drawing the whey?

Mr. Facey.—Just so that I could perceive it; it would draw probably from one sixteenth to a quarter of an inch on the iron.

Mr. Hoard.—I may say that this cheese shows to day a little more dryness than we think desirable, but it retains its flavour beautifully. I am now using that cheese on my own table and I wish I had brought some along with me; I could have shown you your own child at a more mature age than when you saw it last.

Mr. CASSWELL.—In what temperature did you keep them through the hot weather?

Mr. HOARD.—They were kept last summer in the cellar at somewhere about 65 degrees.

Mr. FACEY.—I think they should keep perfectly for two years at that temperature.

Mr. HOARD.—Yes, I believe they would; they are still mild-flavoured and are what I would call very slow maturing cheese, and that I consider the finest cheese in the world.

Mr. LOSSEE.—What was the temperature when you set the cheese?

Mr. FACEY.—I always set at 90 degrees, and then I don't have it ready to cut for nearly an hour. Most of our cheese-makers set at 84 degrees, and for 40 to 45 minutes, but I find that I cannot make a long-living cheese in that way.

Mr. HOARD.—I believe our tendency to-day is to use too much rennet, and the consequence is that we have a cheese that is soon ripe and soon rotten.

The Convention then adjourned until two o'clock p. m.

Upon resuming in the afternoon the President stated that the first order of business was the receiving of the report of the auditors.

AUDITORS' REPORT.

Mr. John Craig read the report of the auditors as follows:—

To the President and Members of the Dairymen's Association of Western Ontario:

GENTLEMEN.—Your auditors, appointed to audit the Treasurer's accounts, respectfully beg leave to report as follows:—We have examined the Treasurer's books and find he holds proper vouchers for all payments made by him on account of the Association, and that he has now a balance on hand of $129.56, for which he produced a certified cheque.

The receipts and expenditures for the current year are as follows:—

Receipts.

By Balance from 1885	$ 577 40
" Proceeds of Convention at Woodstock	225 00
" Government grant	1,500 00
	$2,302 40

Expenditure.

To grant from Association to Provincial Exhibition at Guelph towards prizes for dairy produce	$ 200 00
" grant from Association to Western Fair, London, towards prizes for dairy produce	100 00
" Balance of Salary of Secretary for 1885	100 00
" Salary of Secretary for 1886	200 00
" Treasurer's salary for 1885	30 00
" Expenses for lectures at Woodstock Convention	340 00
" " " Speakers Local Conventions	458 50

To Expenses for Experimental purposes on manufacture of cheese	$ 300 00
" Expenses for Auditors	8 00
" " " reporting proceedings at Convention	50 00
" " " advertising Woodstock and Local Convention.	185 60
" " " Directors' meetings and Sanitary Committee.	158 50
" " " postage, stationery and sundry purposes	42 24
Balance on hand	129 56
	$2,302 40

Ingersoll, 13th January, 1887.

JOHN CRAIG, } *Auditors.*
J. S. PEARCE, }

Mr. CRAIG.—The President requests me to explain this item of $300, for expenses in connection with experiments in the manufacture of cheese. I may say that that expenditure was incurred for making the experiments referred to, but that we have an asset in the form of the cheese manufactured, which will be sold in due course, and will more than meet that expenditure. The result will be that instead of having $129 of a balance we will have at least $429 in hand. (Applause).

On motion the auditors' report was adopted.

ELECTION OF OFFICERS.

The SECRETARY.—The chairman of the nominating committee (Mr. Symington), has requested me to read the following report:—

GENTLEMEN,—We the Nominating Committee beg respectfully to make the following nominations for the year 1887.

President.....Thomas Ballantyne, Esq., M.P.P., Stratford.
1st Vice-President.....E. Casswell, Esq., Ingersoll.
2nd Vice-President.....L. Cleverdon, Esq., Strathroy.

DIRECTORS—Division No. 7.....R. Cleland, Esq., Listowel, P. O.
" " 8.....L. McCallum, Esq., Dunnville, P. O.
" " 9.....F. Malcolm, Esq., Innerkip, P. O.
" " 10.....Wm. Messer, Esq., Bluevale, P. O.
" " 11.....J. B. Lane, Esq., Dorchester Station.
" " 12.....Wm. Symington, Esq., Camlachie, P. O.
" " 13.....James A. Blain, Esq., Cookstown.

AUDITORS—John S. Pearce.....London.
John Craig.....Woodstock.

On motion the report was adopted.

The PRESIDENT.—I have to thank you very heartily for your kindness in again placing me in the honourable and responsible position of President of this Association. I have only to say that had it not been for circumstances that occurred during the past year, in connection with my duties as your President, I would not have consented under any circumstances to accept the position; but I felt in view of the attacks which had been made on my character, in connection with my discharge of the duties of this office—for it was as your President that I was selected to perform those duties—that I could not positively refuse to allow my name to again be put in nomination. Again I thank you for

the honour you have done me. (Applause.) I have had my full share of the honours of this Association. I have ever endeavoured to do my duty to the best of my humble ability; I have spent the best days of my life—the last twenty years without interruption—in trying to improve the dairy products of this country. (Applause.) I have ever been willing, in season and out of season, at all times and under all circumstances, to do what I could for that industry. The practical knowledge I acquired at the commencement of this industry in Canada, and the opportunities I have since had for observation and experience have doubtless to some extent qualified me to perform the duties of this office; and though I am conscious of many defects, yet I will yield to no man in my sincere desire still further to improve the dairy products of this country, and to make Western Ontario pre-eminently a dairy section, for which I think, all things considered, it is especially suited. (Applause.) The matter to which I have referred as the only reason for my again accepting this office, I will again have occasion to deal with more fully in connection with Prof. Robertson's paper regarding the Colonial Exhibition. Meanwhile, I again thank you, and I hope I will never cause you to regret your choice or bring the blush of shame to the face of any man, as President of this Association—(applause)—an Association which has done a great work in the past, and has contributed largely to the position we occupy to-day in connection with our dairy products. (Applause.)

The Secretary.—As one who has been associated with you, Sir, since the inception of this organization, I beg again to congratulate you upon your election as President of this very important institution. I think, sir, I can say with safety that perhaps there is no man in the whole community, in connection with this organization, that has done more or contributed more, or given more time, attention, and ability in endeavouring to promote the interest you have had in view while occupying your present position. (Applause.) I regard it, sir, as a high, important, and honourable position. I have occupied that position myself, and have felt its responsibility, and I am sure that you will feel, like myself, that you occupy a position of credit and honour and trust, bestowed upon you by this important organization, which is so developing the interests of this country, and has contributed so much to the wealth, well-being, and material interests of our community at large. I know, sir, that during the past year a good many reflections have been passed on the course you have pursued and certain actions had and done by you. I have been conversant with the whole history of the affair, and although I can not say that you have always done exactly what was right in the matter, and although I thought that in those respects in which you had erred you should be censured, I believe at the same time that your aim was to do the best for the Association, and to do everything possible to carry out those interests which were confided to you by the provincial Government for the purpose of having a proper representation of our dairy products at the Colonial Exhibition. (Hear, hear.) If you failed in accomplishing that purpose at the opening, I believe it was no fault of yours; I have the best of reasons for believing so, and for knowing that every effort was made on your part to further the interests which you were sent to represent, although circumstances beyond your control prevented its being a success at the outset. I thought, however, that you did not do exactly right when, having failed in making that representation at the exhibition—and I am going to speak plainly—you did not confide to your colleagues the reasons for that failure. I don't say by any means that your failure to do so was intentional; I believe it was more an error of judgment than anything else; but I think it would have saved a considerable amount of unpleasant reflection if you had taken your colleagues into your confidence on that occasion. I know all the particulars; and I know you were not at fault: but I was not in a position to take that stand in your defence which might have been taken under different circumstances. I have expressed my sentiments on that point plainly and frankly; and I hope you will receive them without offence. I beg again to congratulate you on your re-election as President of this institution. (Applause.)

The President.—As I have intimated before, I do not intend at present to discuss the question which has just been raised, but this evening I shall take occasion to refer to it at some length in connection with Prof. Robertson's address. Mr. Robertson will be able to tell you very particularly what was done eventually, in connection with the

cheese exhibit at the Colonial Exhibition, and I am glad to say that he did his work in a most capable and efficient manner. In fact it would be difficult to find any person in any country who did his work so thoroughly and so well as he did it, and as he only could do it, in my judgment. (Applause.)

THE LATE MR. HENRY PARKER.

Mr. CASSWELL.—I think this would be the proper place to move the following resolution :—

Resolved, That the Western Dairymen's Association, in convention assembled at Ingersoll on the 13th January, 1887, hereby express their deep regret that Henry Parker, Esq., Woodstock, first vice-president of this association, has, in the providence of God, been removed by death during the past year. His services to this association and to kindred organizations were most valuable, and we hereby instruct the secretary to prepare a condolatory letter addressed to his widow, expressive of the heartfelt sentiments of this association as to her loss and theirs, and that the same be recorded in the minutes of the association.

I need only say that I have much pleasure in moving the resolution, as I always found the late Mr. Parker a good worker in this association, especially on committees, and we must all regret that he was taken away from us in so sudden a manner.

Mr. CLEVERDON.—I second the resolution and I would suggest that it should be engrossed; it will cost only a few dollars, and I am sure it would be appreciated by the widow and family.

Mr. JOHN CRAIG.—Before the resolution is put I should like to say a word or two upon it. I was long associated with the late Mr. Parker in his connection with organizations of this nature, and worked side by side with him for many years. He was taken very suddenly away from us when he was apparently in robust health; on the Tuesday he was seemingly perfectly well, and on the Friday he was stricken down. It was not only a severe blow to the citizens of Woodstock, but to a much wider circle in the community, who knew the late Mr. Parker through his public acts and proceedings, and admired his public conduct. I think it is due to his memory and to ourselves that we should take some formal notice of this melancholy event, by giving expression to our sentiments of regret and respect for him, and conveying our hope to the widow that the Great Consoler will come under her roof-tree, and that she may find that "behind a frowning providence, He hides a smiling face."

The PRESIDENT.—I entirely concur in the remarks which have been made by the mover and seconder of this resolution, and by Mr. Craig. In the providence of God one of our officers has been very suddenly removed by death, and I think it behooves us to express to the widow and children our sympathy with them in that painful event. I have no doubt that you will wish the resolution to pass, and a copy to be sent to the widow of the late Mr. Parker.

The SECRETARY.—I don't understand that that is the intention of the resolution; I see that the secretary is to be instructed to draft a condolatory letter to be addressed to the widow. I don't quite agree that that is the most desirable course, because the secretary might use expressions in such a letter which would not be acceptable to this organization. I think a letter of that kind should come from the association itself, and should have its assent. Of course I am quite willing to prepare such a letter if I am directed to do so by the association, but at the same time I do not think it would be exactly becoming for the secretary to be the sole authority in giving expression to the feelings of the Association without their assent.

The PRESIDENT.—I would suggest that a committee consisting of the mover, the seconder, Mr. Craig and the Secretary be appointed to prepare the letter, and submit it at a subsequent meeting.

Mr. CASSWELL.—The reason we worded the resolution in that way was that we had every confidence in the Secretary's powers to write such a letter, as he had spoken to us on the subject.

The PRESIDENT.—As the suggestion I made appears to be acceptable to you, I would name as a committee the gentlemen whom I previously suggested.

Mr. CLEVERDON.—Is it understood that the authority is given to have it engrossed?

The PRESIDENT.—I think so.

DISTRICT CONVENTIONS.

Mr. Leitch presented the report of the Committee on District Conventions as follows :—

After carefully considering the question referred to them your Committee beg to report as follows :—

1. We recommend that meetings be held to promote the dairy interests in the various outlying districts, and that as far as practicable local dairymen's associations be organized in these districts, the members of which to pay an annual subscription of 25 cents each, the subscriptions to be handed to the Western Dairymen's Association, to be used in defraying the expenses connected with holding meetings and employing cheese instructors, etc., in the respective districts.

2. We recommend that thoroughly competent cheese instructors be secured, and that each factory, in groups of not less than 20, desiring the services of these be required to pay $5.00 per annum, and that the Government be asked for an additional grant to aid in paying the expenses connected therewith.

These are the conclusions we came to amongst ourselves, but of course we would like to hear the views of the Association on the question.

The PRESIDENT.—You have heard the report of the Committee to whom was referred the resolution of the dairymen who came here from the western part of the province for the purpose of making representations regarding the formation of local associations. Is it your pleasure that the report should in the meantime be laid on the table, so that there may be an opportunity for discussing it further?

The report was tabled.

FEEDING OF STOCK, ETC.

Mr. MCNEISH.—I desire to ask Prof. Arnold a question about feeding stock, and that is whether in England they feed twice a day, or half a dozen times a day, or how often?

Prof. ARNOLD.—They generally feed three times a day. Their feeding is not very different from ours, only they are more punctual in giving their cows all they will eat. With regard to the question which was asked some time ago by Mr. Leitch, as to how they produce these rich grasses in England, I would just say that they do it there by the extraordinary fertility of their soil. You cannot produce good, rich, succulent grasses from a poor soil, and the land there has a finer tilth than ours, and when you get rich land you not only get a vigorous growth but a rich grass. A very little drought is sufficient to injure the grass on a poor soil, but if the soil is deep and rich, it will not only grow luxuriantly in favourable weather, but it will withstand the drought better; the poor land does not retain the moisture so well. To starve the land is to make the milk costly. As I observed in my remarks this morning, the English, by keeping up the fertility of their soil, are able to raise twice as much per acre as we do, but it does not cost twice as much to cultivate the land. They make their ground rich, not so much by purchasing outside manures as by preserving everything they raise on the farm, and if we were as careful to

do that as they are we would soon become independently rich. There is nothing to prevent you from raising three or four tons of hay to the acre if you feed the soil as they do, for there is nothing in their climate which gives them so great an advantage over us if we paid as much attention to keeping up the fertility of the soil.

Mr. McNeish.—What I meant to enquire was, whether it was most profitable to feed three times a day or oftener.

Prof. Arnold.—I do not think it makes any great difference; I have found cattle do as well fed twice a day as those fed oftener. But, on the other hand, I have known cases where cattle fed as often as five times a day did remarkably well, but I believe the reason was not so much in the frequency of the feeding as in the fact that, if a man is so attentive to his cattle as to feed them five times per day, he is likely to be attentive to them in every other respect. If those who feed twice a day were equally attentive in caring for their cattle, I believe they would do equally as well.

EXPERIMENTS BY PROF. ROBERTSON.

The President.—I have great pleasure in introducing Prof. Robertson, who will give you the results of the experiments which he has made this year in connection with the Association.

Prof. Robertson.—I labour under some difficulty in addressing you this afternoon, having only received the report of the committee of examination a short time ago, so that I have not had as full an opportunity for tabulating the results as I could have desired, and I was extremely anxious that my conclusions should not be based on my own judgment alone. I am glad to be able to say that, so far as these gentlemen have examined the cheese, their opinion agrees with my own as formerly recorded, so far as any results from different methods of making are concerned. Before dealing particularly with these experiments, I wish to discuss, in a few words, the paper which has been read by Mr. Macpherson. He commenced his paper by saying that certain stable factors, in the process of cheese-making, should be recognized, and that being recognized and used they would yield the same certain results as the operations of a piece of mechanism. Well, if the factors of organized bodies, such as cows and milk, were always constant, we might have constant results; but the vitality and individuality of a cow are very uncertain quantities, and therefore it is rather difficult to know those factors well enough to be able to arrive at a certain result, with a given quantity of milk, a given quantity of rennet, and by observing a given temperature. I quite agree with Mr. Macpherson that all these things are subject to the operation of natural laws, and that those laws never vary in their operations. If we could have the quality of the materials which we handle always alike, then the operations of these laws would always give the same results. It is for cheese-makers and dairymen to seek to have such uniformly fine milk for the same process, to have their buildings so constructed that they can regulate their temperature irrespective of the temperature outside, and to pay such attention to all the other details of their work that they can, as far as possible, control the results from the operation of these laws and thereby secure as nearly a uniform product as possible. If they attend to these matters, this problem of how to make a uniform product will be very much simplified. That brings me to the question of the aeration of milk, which has a good deal to do with producing cheese of a uniformly fine quality. It is impossible to have milk which is ripe for cheese-making without a certain amount of age, and besides, it will require a certain amount of aeration, for the maturity of the milk has much to do with the keeping qualities of the cheese. This was shown long ago in the making of cheese from new milk twice a day. It was found that the cheese which was made of Monday morning's supply of milk—(it having the older and riper milk of Sunday mixed with it)—always had better keeping qualities than that which was made at other times.

Some cheese-makers, seeing that that was the case, began to ripen their milk by the addition of sour whey, but that method of ripening has not the same effect on the cheese, in regard either to flavour or keeping qualities, as the ripening which is induced by the lapse of time and a proper temperature. It seems necessary that milk should be kept for a certain time, and kept at a certain temperature, to bring about a proper state of maturity, and to have the process of cheese-making properly begun. If cheese-makers were to encourage and instruct their patrons how best to treat their milk, in order to secure that end, they would at least have a fair start in the process. It is a difficult matter to make fine cheese out of inferior milk, though I do not believe that it is impossible, and this is a point as to which I would again urge that cheese-makers should first inform themselves, and then pass on their knowledge to their patrons. As Mr. Macpherson very well said, there are, perhaps, only two main factors to be taken into account in the process of cheese-making, but the conditions under which those factors operate best have to be considered. These agents are rennet and fermentation. I agree with Mr. Macpherson in giving them those names, as they are perhaps the only two agents we have to count upon in the operation of making ordinary Cheddar cheese. But as the rennet will work better in some temperatures than it will in others, and as temperature has a great influence on fermentation, cheese-makers sometimes call temperature another agent, though it is in reality only a condition. In discussing the conditions, and in his remarks in reference to consistency, I did not quite get an accurate knowledge of what was meant by that term consistency. I take it to mean the proper proportion of the constituents of the curd at a given time of the process. Temperature will make rennet operate slowly or rapidly ; and the condition of the curd as to the proportion of its constituents—the percentage of water and the percentage of curd and fat will affect the operation of the rennet and the fermentation. It is necessary to understand the exact meaning of this term consistency—that is, that it means merely the presence of a larger or less amount of moisture—before we proceed to consider other stages of the process. To begin at the beginning of the process, let me say that it is necessary to examine the milk before the addition of the rennet, so as to see whether it is in the best condition for receiving the rennet or not, and that can be best done by the sense of smell. I have very little faith in the test of putting a small portion of rennet into a small quantity of milk ; for rennet is so powerful an agent, and its active principle is contained in such minute globules that a large number of them might be in a small quantity of the liquid extract, so that I do not think that that test is a certain one. In Cheddar cheese-making, fermentation is, perhaps, all of one kind ; although it seems to arrive at two different results. Fermentation, Mr. Macpherson says, may be either lactic or putrefactive ; and I think, describing them by their results, he said, one may be called a decomposing fermentation, or a disintegrating fermentation, and the other an assimilating fermentation. I think both are of one kind, but take place under different conditions of the curd. If it proceeds to a certain extent, and there is an excessive amount of moisture present, there is a disintegration of the curd ; but if it does not take place until the moisture is pretty well expelled, it will not cause disintegration, but will combine the caseine with the moisture and the fat to make a good, plastic, solid, and keeping cheese. As to what fermentation really is, and how it happens, it may well be illustrated by the yeast plant, which increases by the rapid multiplication of its organisms, producing carbonic acid gas. The air seems to be filled with such organisms, and I consider that the fermentation in Cheddar cheese is produced by the milk receiving myriads of such germs, or spores, which are common in our atmosphere, and which, by setting up a fermentation, cause the cheese to ripen. I think the ripening process is due to their action. If we look at cheese-making in France and other European countries, it seems to be beyond a doubt, that many of the different kinds and varieties of cheese are produced by the different kinds of organisms in the curing-rooms, so that it is impossible in a particular curing-room, by any sort of manipulation, to produce any but the one variety of cheese. A particular kind of organism, or "fermentation starter," will start a particular kind of fermentation, and impart a particular flavour. In the process of Cheddar cheese-making, the first action of the rennet is merely to coagulate the curd, so as to hold the fat ; it encases it, as it were, in the mass. The second action of the rennet is to expel the moisture, while contracting the mass of the curd, and with that, I think, its action nearly ceases,

although it may be the agent originating, or helping to originate, the curing fermentation. Now, that is perhaps interfering with many of your beliefs. I find to-day that cheese made by the addition of as much as eight ounces of extract per 1,000 lbs. of milk has been pronounced by the committee to be of superior quality, superior flavour, and a better keeping cheese, than cheese which was made from the same milk, by the same process, at the same place, and cured in the same way, but made with less than one-half the amount of rennet. I had believed that rennet was the only active agent in the curing of cheese, but I have been disturbed in my belief, by my own examination, confirmed as it is by the report of these gentlemen. The agent which I believe has to do with the ripening of cheese is that peculiar fermentation, originated or aided by the action of the germs, or spores, from the air, and which produces the lactic acid; I believe that, subject to the ordinary conditions, the exposing of milk to the air, etc.—this will produce the true Cheddar flavour, no matter how the curd is manipulated, if excessive acid be not developed before the moisture is sufficiently expelled.

Mr. Macpherson.—That is exposing the milk to the air?

Prof. Robertson.—Yes. If this fermentation begins to act on the mass of the curd before a certain amount of the moisture has been separated out of the curd, then the fermentation will prevent that separation from being thoroughly accomplished afterwards; so that the point of drawing the whey off the curd has to be determined, not so much by the development of the acid in the curd or the whey, as by the expulsion of the excessive whey out of the curd before acid is perceptible. The important point, then, is to get the curd dry enough before the fermentation (indicated by the presence of acid) begins, and in the ordinary method that is almost impossible if the whey is left on the curd. When the curd begins to show strings on the iron we should have the whey removed at once before the fermentation goes further, as, if it is left on the curd then, it becomes very difficult afterwards to remove it out of the curd. This removal merely brings a new force to our help in the separation of the whey out of the curd. The fermentation is indicated by the stringing on the iron or the presence of lactic acid, which is mainly a consequence of fermentation. That being so, it becomes necessary to have the whey drawn sweet—as we understand the term—before there is lactic acid to such a degree that its presence is indicated as I have described. That is a sufficient warning to me that I should then have the curd free from all excessive moisture, and I can assure myself of having it in that condition by removing the whey from it, and thus leaving it in the best possible condition as regards dryness. The rennet action may proceed far enough to separate sufficient moisture from the curd, but beyond that point I do not know whether it helps the curing or not. I certainly can succeed in making fine cheese by ignoring its action in that respect.

Q.—Did you ever try anything else than rennet for the coagulation of milk?

Prof. Robertson.—No, I have not, in cheese-making; I have not had suitable opportunity. My experiments convinced me that we must dry the curd sweet, especially in summer time, because then we seldom have the curd sufficiently dry before the lactic fermentation begins, and, therefore, to be on the safe side the whey ought to be drawn before the acid is discernible. In the fall of the year, if the milk is in perfect condition, you may succeed in making good cheese by adopting the other course, but I do not think you would be safe in attempting it in the summer time. With regard to the value of lactic acid itself, I have spoken of it as resulting from a kind of fermentation, which may be the fermentation of the Cheddar factor (as I call it) in cheese-making. For cheese-making purposes it is sufficient to describe it in that way. Now, is the production of lactic acid of any service to the cheese-maker? Can we make cheese without it that will keep well? I think such a process is possible, but I do not think the result would be profitable to Canadians, for the simple reason that lactic acid serves some good purpose in our cheese-making. If milk is tainted, that taint is usually to me an evidence that some other objectionable germs or ferments are at work in the milk, and the odour of the milk is merely a production of those germs. Hence it is not so much the odour that we should try to get rid of as the germs that cause it. Aeration will remove certain kinds of taints, such, for

instance, as that of turnips and other vegetables, depending on volatile oils; but the worst forms of tainted milk cannot be corrected in that way because they are due to the presence of organisms which multiply with extreme rapidity. Aeration or oxidation, so called, does render the milk and curd less suitable as a field for their activity. It is a common practice in some factories, when what are called pin holes in curd are observed, to begin stirring and airing the curd so as to cause these apertures to disappear. But in doing this the makers are simply trying to drive away the outward manifestation of the cause without removing the cause itself. I find that by keeping the curd warm and developing the lactic acid, the bad effects of these organisms will disappear, and they are at any rate prevented from doing their work over again. I may say that I have not yet been able with the microscope, nor by isolation, to observe the multiplication of these organisms from pin-hole curds, or to destroy them by lactic acid, but I think I shall yet succeed in doing so. I do notice this, however: that a peculiarly tainted milk which we have is in some places producing outbreaks of typhoid fever and diphtheria. Doctors all over the country report that it results in those diseases, and especially in producing diphtheria among young children. I find also that it is the practice of some physicians to syringe the throats of patients suffering from diphtheria with lactic acid, for the purpose of destroying the organisms of diphtheria. These organisms may have come from the milk which has been used by the patient, or by those in whom the disease originated. Now, if that is the case, and if we can ascertain that lactic acid can be used successfully to destroy those germs in the disease, then I think we have commenced to recognize scientifically a very important principle in connection with cheese making. I will now state what we did in the experiments to which I have referred, and will also show some of the conclusions to which I think they point.

I. On July 30th, a quantity of milk was put into one vat and thoroughly mixed. It was then, in equal parts of 1890 lbs. each, put into the three compartments of a vat which had been so constructed. The temperature of all three quantities was exactly alike, viz., 85° Fahr.

At 11 a.m.
- 3 oz. of Hansen's Rennet Extract per 1,000 lbs. of milk were added to division No. 1.
- 5 oz. of Hansen's Rennet Extract per 1,000 lbs. of milk were added to division No. 2.
- 8 oz. of Hansen's Rennet Extract per 1,000 lbs. of milk were added to division No. 3.

After coagulation and cutting, all three were gradually and carefully heated to 98° Fahr. By 2.05 p.m. acid hairs could be seen by the hot iron test from the curd of all the lots. The whey was then drawn off, and the curds were dipped into a sink having a linen strainer on maple racks. They were kept under similar conditions of temperature, from 98° to 94°, and were well packed up and frequently turned. By 4.30 p.m. the curds were sufficiently mellowed, and enough acid was developed for the application of salt. The Macpherson curd mill was used for cutting, after which the curds were hand-stirred for fifteen minutes. Salt was then applied to all three lots at the rate of 2½ lbs. per 1,000 lbs. of milk. The temperature was then 86°. The different lots were put to press as nearly as possible at the same time, temperature 80°.

July 31.	Lot 1, weighed from the hoops	171¼ lbs.
	Lot 2, " "	175¼ "
	Lot 3, " "	177½ "
Sept. 14.	Lot 1, weighed	165½ lbs.
	Lot 2, "	169 "
	Lot 3, "	170¾ "

On August 28th the qualities were compared. In point of flavour Lot 2 was first, Lot 3 second, and Lot 1 third. The notes made at the time show :—

	Lot 1.	Lot 2.	Lot 3.
Flavour	Clean, but with a curdy acid still perceptible.	Clean, rich, full.	Good, rich.
Body	Best, solid, firm.	Rich and tender.	Rather soft.
Texture	Best, flinty, silky.	Rather short.	Good, flaky.
Colour	Bright amber shade.	Not so amber-like as Lot 1.	Rather paler than Lots 1 and 2.
Appearance	Third.	First.	Second.

On September 4th another examination confirmed the former conclusions, but lot 1 had by that time less of the acid flavour and was on the whole equal to lot 2 and worth more than lot 3.

On December 30th lot 1 held the first place, lot 2, second and lot 3, third. The difference, however, was not very marked.

From July 30th to September 14th all the cheese made experimentally were kept under the temperature conditions of an ordinary factory curing room, from 80° (which was too high) to 60°. From September 14th till December 30th, the cheese were kept in boxes at an average temperature of 50°.

On January 13th an examination by the Committee appointed by the Association confirmed the December judgment.

II. On August 2nd a vat of milk was similarly prepared; 1,900 lbs. were put in each of three compartments, the temperature being 88°.

At 10.35 a.m.
- 3 oz. of Arnold's Rennet Extract per 1000 lbs. of milk were added to lot 1.
- 5 oz. of Arnold's Rennet Extract per 1000 lbs. of milk were added to lot 2.
- 8 oz. of Arnold's Rennet Extract per 1000 lbs. of milk were added to lot 3.

After coagulation and cutting all three were gradually and carefully heated in the usual way to 98°. By 1.20 p.m. acid hairs could be seen by the hot iron test on the curd from all the lots. At this stage the curd in lot 3 was firmer and drier than that in lot 2, and much more so than lot 1. The whey was left on the curds until the hot iron test showed hairs about three-quarters of an inch long. Then they were dipped into a sink as formerly, after which they were hand-stirred and kept from matting. By 2.30 p.m. they were all mellow enough and sour enough for the application of salt. Salt was applied at the rate of $2\frac{1}{2}$ lbs. per 1000 lbs. of milk. The lots were put to press at the same time and otherwise similarly treated.

Aug. 3.	Lot 1, weighed from the hoops	.....	$179\frac{1}{2}$ lbs.
	Lot 2, " "	.....	$180\frac{1}{2}$ "
	Lot 3, " "	.....	$177\frac{1}{2}$ "
Sept. 14.	Lot 1, weighed	.....	$172\frac{1}{4}$ lbs.
	Lot 2, "	.....	$173\frac{3}{4}$ "
	Lot 3, "	.....	$171\frac{1}{2}$ "

On August 28th the qualities were compared. All three lots were rather rank in flavour and somewhat raw in body and texture.

On September 4th, there was appreciable difference in favour of lot 3, which had better flavour and firmer body than the other two.

On December 30th, lot 3 was decidedly the best cheese; lot 2 was not much better than No. 1; while lot 1 was quite inferior in flavour, body, texture, colour and appearance.

On January 8th they were again examined, and on January 13th by the committee already mentioned. Both of these comparisons showed an increasing difference in favour of lot 3, which then was a passably good cheese. All three lots were quite inferior to the three lots from which the whey had been drawn sweet.

In both tests the curd, in which the largest amount of rennet extract had been used, was firmer and drier in body than the others when the presence of acid was perceptible, but in the case where the whey was drawn sweet, as in the first test, the curds of the three lots were nearly equally firm and dry to the touch before much acid was developed.

The cheese of the three lots of both days' make were treated precisely alike, except as to quantities of rennet added. The three lots made on July 30th were all in excellent condition on January 13th. On the same date the cheese made August 2nd from the use of the unusual quantity of 8 oz. of rennet extract per 1,000 lbs. were in good condition, while the other lots, in which there had been used 5 oz. and 3 oz. respectively per 1,000 lbs. milk, were off in flavour and in every way inferior.

The lesson taught by these facts is that the quantity of rennet added for coagulation of the milk has less effect on the keeping qualities and curing of the cheese, than has the condition of the curd as to its dryness and firmness, or softness and moistness, while the acid is developing. The early removal of whey from the curd favours its speedy separation out of the curd to its proper degree.

III. A test was made to determine the effect of using different quantities of salt of one kind on several cheese made from one batch of curd. On July 30th, 3260 lbs. of milk in one vat was set at 86°. At 10.35 a.m. 3 oz. of rennet extract per 1,000 lbs. milk was added. Coagulation commenced to show at 10.55 a.m., and cutting was performed at 11.15 a.m. Heat was applied at 11.35 and by 12.15 p.m. the temperature was 97°. Acid hairs were visible from the hot iron test at 2.30 p.m. The whey was at once removed and the curd was dipped into a sink. It was stirred for ten minutes and then packed and frequently turned. By 4.45 p.m. it was ready for salt. It was cut by the cutter already mentioned, and stirred for ten minutes. The whole curd then weighed 332½ lbs. This was divided into five equal portions, when to—

Lot 1	was added salt	at the rate of 2	lbs. per 1,000 lbs. milk.
" 2	"	2¼	"
" 3	"	2½	"
" 4	"	2¾	"
" 5	"	3	"

The temperature, after the salting was completed, was 86°, and hooping was proceeded with in fifteen minutes.

	July 31th.	Sept. 14th.	Dec. 30th.
Lot 1 weighed	62½ lbs.	59½ lbs.	58 lbs.
Lot 2 "	62¼ "	59½ "	58 "
Lot 3 "	61½ "	58¾ "	57½ "
Lot 4 "	61 "	59 "	57½ "
Lot 5 "	61 "	59 "	57 "

By August 28th the examination showed—

	Flavour.	Body.	Texture.	Colour.	Appearance.
Lot 1	Bitterish.	Raw.	Short.	Chalky.	Fourth.
Lot 2	Less so.	Less so.	Less so.	Less so.	Third.
Lot 3	Fine, clean.	Firm.	Silky.	Bright.	First.
Lot 4	do	Too dry.	Toughish.	do	Second.
Lot 5	do	More so.	do	do	Second.

On September 4th the foregoing judgment was confirmed, but lots 1 and 2 were somewhat improved in flavour and body, and lots 4 and 5 were considerably mellowed.

On December 30th in point of flavour the order of merit was lots 5, 4, 3, 2, 1; in point of body the order of merit was lots 2 and 3 equal, 4, 5, 1.

On January 8th the market value was in the order of lots 3 and 5 equal, 4 and 2 equal, 1.

On January 13th the examining committee put the value in the order of 5, 4, 3, 2, 1, although I considered lot 3 the most valuable cheese for immediate use.

IV. On July 31st a vat of milk was treated in the usual way, the purpose being to test the comparative values of different kinds of English and Canadian salt for cheese-making. After the curd was thickened, cut, stirred, heated, dipped sweet, ripened, and soured, seven equal lots of unpressed curd were weighed out. The rate of salting was $2\frac{1}{4}$ lbs. per 1,000 lbs. of milk in each case. To lot 1 was added Higgins' salt; lot 2, Ashton's salt; lot 3, Rice's salt; lot 4, Coleman's salt; lot 5, Kidd's salt; lot 6, Rogers' salt; lot 7, a mixture of Higgins' and Ashton's salt.

The weights of the several lots at the different dates, were as follows:—

	Aug. 2nd.	Sept. 14th.	Dec. 30th.
Lot 1 ..... lbs.	$64\frac{1}{2}$	$61\frac{1}{2}$	$62\frac{1}{2}$
Lot 2 ..... "	65	$63\frac{1}{4}$	$61\frac{1}{2}$
Lot 3 ..... "	65	$63\frac{1}{4}$	$61\frac{1}{2}$
Lot 4 ..... "	$65\frac{1}{2}$	$63\frac{3}{4}$	$62\frac{1}{4}$
Lot 5 ..... "	$65\frac{1}{2}$	$63\frac{3}{4}$	62
Lot 6 ..... "	$65\frac{3}{4}$	$63\frac{3}{4}$	$62\frac{1}{2}$
Lot 7 ..... "	$65\frac{1}{4}$	$63\frac{1}{2}$	62

On August 28th the order of value was lots 4, 5 and 6, equal; 7; 1, 2 and 3, equal. Lots 4, 5 and 6 had a full clean flavour, but were rather coarse in texture. Lots 7, 1, 2, 3, had a sweety flavour, smooth body and rather limp texture.

On September 4th the previous judging was agreed to; but on January 13th the committee placed them in the following order of merit: 5, 4 and 6 equal, 2, 1, 7, 3.

V. On August 2nd the test was repeated with curd from another vat, six equal lots of curd being weighed out and salted as before, when to lot 1 was added Higgins' salt; lot 2, Ashton's salt; lot 3, Rice's salt; lot 4, Coleman's salt; lot 5, Kidd's salt; and lot 6, Rogers' salt.

The weights of lots were, at the respective dates, as follows:—

	Aug. 3rd.	Sept. 14th.	Dec. 30th.
Lot 1	62½	61¼	59
Lot 2	62¾	61	59¼
Lot 3	63	61	59½
Lot 4	63¼	61	60
Lot 5	62	60	58½
Lot 6	62¾	60½	59

On September 4th lots 1 and 2 were buttery, smooth and rather weak in body and rank in flavor; lots 4, 5, 6 and 7 were rather better than 1 and 2, but had harsher body.

On December 30th the following was the order of merit recorded: 4, 6, 2, 5, equal; 1, 3.

On January 13th the Committee reported the quality in this order: 4, 2, 5 and 6 equal, 1, 3, with hardly any appreciable difference between the qualities of lots 4, 2, 5, and 6.

VI. On August 4th one cheese from each of three lots of curd was salted with a mixture of the four kinds of Canadian salt, and one cheese from each of the same three lots was salted under the same conditions, at the same rate, and at the same time with a mixture of the two kinds of English salt; 2½ lbs. per 1000 lbs. of milk being the quantity used.

On January 13th the Committee awarded the first place in two of the lots to the cheese salted with Canadian salt, and in the other case to the cheese salted with English salt.

The different kinds of salt were all bought through the ordinary channels of trade, care being taken to obtain samples true to their names.

My own inspection of the cheese was made once with and once without consulting notes of how the cheese were made or what kinds of salt were used. The examination by the Committee appointed by the Association was made and their report given according to numbers affixed to the several cheese, and without any knowledge whatever of the treatment of manufacture or the quantity or quality of salt used in their making.

The PRESIDENT.—The rennet test shows that its action is altogether different from the generally accepted theory. It is generally supposed that the functions of rennet exercise an effect in curing the cheese as long as the cheese exists; but these experiments may have proved the very opposite, the ripening being about the same in the case of a large quantity of rennet being used, and when the smaller quantity was used. I would ask Prof. Robertson in this connection, if it is not his opinion that in the early part of the season a larger quantity of rennet should be used than in summer, as the milk is generally in a somewhat acid state at that time, owing to the feed of the cows. I recollect that some years ago we were advised to use a larger quantity of rennet in the early part of the season, so as to avoid the leakiness which had been complained of in the cheese made at that time, and the result has been that that kind of cheese has almost disappeared among those who acted upon that advice.

Prof. ROBERTSON.—I think experience proves that we cannot afford to use a small amount of rennet in spring, and I think this newer knowledge we have obtained does not interfere with that. The first action is coagulation, and then there is separation. Now, in the spring the milk is apt to turn acid very rapidly, and unless an extra amount of rennet is used it will become acid before the separation is completed. Rennet has another effect, too, and that is in expelling just sufficient moisture; you get more cheese, and the extra moisture you conserve is an improvement if you have the right kind of fermentation started at the right time as to the curd's condition of dryness.

Mr. LEITCH.—At what temperature would you put the curd to press?

Prof. Robertson.—Well, I would not take that into account beyond this, that if the curd be put to the press too warm, there is a likelihood of more fat being separated on the press tables. I would rather put the curd in the hoops warm than leave it too long to cool off.

The President.—What time does it take after the salt is added before the curd is in proper condition to put it in the press, so as to avoid those holes which are so common in cheese under the present process?

Prof. Robertson.—Not less than twenty minutes, and not more than three-quarters of an hour.

Q.—Do you believe in putting the curd in the press immediately after the salt is put into it?

Prof. Robertson.—In about fifteen minutes usually after the salt is applied the hooping may be commenced. I think the curd should be well aired for ten or fifteen minutes before the salt is applied.

Mr. Casswell.—What is the relative value of the three cheeses which were tested?

Prof. Robertson.—If I were buying I think I should pay as much for the one as for the other.

The President.—I think Prof. Robertson hardly emphasized enough the difference in quality where a small quantity of salt was used; that cheese was positively bad.

Mr. Casswell.—Those are not the ones that I mean.

Prof. Robertson.—If I were buying for the English market, and bought them under very careful inspection, I should perhaps pay two shillings a cwt. more for the cheese with the three ounces of rennet than for that with eight ounces. That is for the cheese when the whey was drawn sweet. In the case of the three lots where the whey was not drawn sweet, the cheese from the eight ounces of extract per 1,000 lbs. of milk was worth 20s. per cwt. more than those from using three ounces per 1,000 lbs. I think as between the three and five ounces there is very little difference, only that one has a little better texture than the other, and that is something that the London buyers would look to. The President says that I hardly emphasized enough the difference between the cheese made with three pounds of salt per 1,000 lbs. of milk and that which was made with two pounds of salt. On that point I would simply say that the cheese which was made with two pounds of salt was worth about forty shillings per cwt. to-day, while that with three pounds would be worth perhaps fifty-six or fifty-eight shillings in the English market, while that made with two and a-half pounds would be worth as much as that made with three pounds. Too little salt makes the cheese spoil altogether, but if you put in a little too much it merely makes it a little longer in ripening, with the certainty that it will come quite right in time. I find from studying the wants of the retailers in England, that in summer the English retailer will prefer a Canadian cheese of good flavour and pretty firm body rather than a moist cheese. I may say that cheese made from curds in which the acid was developed in the whey had not in a single case that flinty texture and silky feel in anything like the degree that is appreciated in the English market.

The President.—Cheese-makers should remember that our summer cheese does not all go into early consumption, and if anything will help Canadian cheese, and if there is anything which is helping it now in the English market, it is its good keeping qualities—the result of drawing the whey early, stirring the whey thoroughly, and salting well.

Mr. Casswell.—With regard to this question of moisture, I hope that Canadians will not deviate from the standard of cheese they have been making. I know two or three instances in which the publication of the circular last year, about making Canadian cheese more moist, has done harm; and, on the other hand, I do not find an instance in which makers have lost anything by making their cheese the same as they have made it for the last four or five years—with a good, firm, solid, flinty texture.

Mr. Macpherson.—I was much pleased with Prof. Robertson's remarks, and I find that my experience just confirms his. There is one point, however, that I think we have

not considered sufficiently, and that is this question of moisture. It is true that we can have a cheese with plenty of moisture in it, and still it may be a poor cheese. What we want is to have the moisture assimilated with the solids of the cheese, and the only way to do that is to develop that class of fermentation which will encourage that assimilative process, and I believe that fermentation is developed between ninety-five and ninety-eight degrees. I think you will find that the best cheese-makers in your section produce their cheese by keeping the curd warmed up to ninety-five or ninety-eight degrees. From my experience I find that ninety-eight will give you a more mellow texture along with a solid body, because the assimilation goes on perfectly in all parts. I would also confirm Prof. Robertson's remark as to the salting of curd after being ground—that it is necessary to air and stir the curd before salting for about thirty minutes, and then about thirty minutes afterwards. Then it should be put to press, and pressed gently at first, the pressure being gradually increased.

THE DAIRY COW.

Mr. HOARD then addressed the Convention on the subject of the Dairy Cow, illustrating his remarks by references to large plates of celebrated dairy and other cows, which were suspended from the platform. He said: Before I say anything on the dairy cow, I wish to read you an indictment, from an address delivered before the Eastern Dairymen's Association by Mr. Thomas Shaw, editor of the *Live Stock Journal*, Hamilton, in 1886. I agree with Mr. Shaw's views as therein expressed:—

Our dairymen deserve great credit for the perfection to which their working machinery has been brought, and yet the most important machine of all, the dairy cow, is still in a most woefully crude state, not yet wrought up to half her possible capacity. If even now the yield to her owner be a profit, what will not that profit be to dairymen who are not content with anything less than 5,000 pounds of milk per season from each cow, instead of 2,692 pounds, the average at present less than it was in 1882.

Nearly 40,000 stanchions had to be made in Ontario dairies last season to accommodate the increased number of cows, which swells the grand total to 750,000 head, and yet the deplorably low standard of only 2,692 pounds per cow for the season, has been reached—a state of affairs very surprising indeed when we consider the extent of the interests at stake.

The battle of the dairy breeds still rages fiercer, and rage it will in coming time. As to which is the best dairy cow, will form a fruitful subject of controversy in the future as in the past. But, while the champions of the different breeds are wasting their ammunition in cross-firing to but little purpose it may be, the dairyman alive to his own interests will be handling the breed he has in hand to the best possible advantage. We cannot map out the whole ground which he will go over in this paper, but will indicate some of the leading paths.

He will be scrupulously careful as to the bull which he uses, that is where the offspring is to be raised, none other will suffice than one from a dam, a large milker, whether with or without breeding. He will adhere to a line of breeding definite in its aim. Instead of trying to get a Guernsey-Jersey-Ayrshire-Holstein-Shorthorn cow, he will rather aim at getting a grade of *one* of these, higher and higher in gradation every time, but in one line. Even if his cow is a scrub, he will aim at getting a consistent one, fine enough to go into a scrub register. Experimenting in producing cross-bred dairy cows is a luxury too expensive, and too hazardous for the ordinary dairyman to engage in. The calf that he gets, while he will take every care of it, he will not force it on too fast, lest an undue tendency to fleshiness be developed, which may militate against the future milk product, or in other words, he will remember that the treatment best suited to the production of a model dairy animal is quite different from that which will produce a model beefer. He will keep breeding and selecting from the best, or purchase from some one thus engaged, and as the years roll on he will have an ever-improving herd of dairy cows.

I have no apology to make in standing before an audience like this once more, and saying, as I have said many hundred times in my life before, that I am no advocate in any sense whatever of the "general purpose" cow. I address you as practical men, men who, I suppose, use the pencil in working out their business—and any man who will not estimate the forces of his business, the cost of his business, and its relations to him in its economies—that man has no business with his business. It is of the first consequence for a man who puts himself to the outlay of what we call in the aggregate "the dairy expense"—say to the management of 20 or 30 cows—that he should certainly have a good dairy machine. He wants an animal that will bring him the best cheese production, or the best butter production; but in talking with the farmers all over the country

I find that they are a good deal like the little boy who wants to eat his cake and sell his cake and give away his cake. (Laughter). I hear hundreds of farmers uttering this heresy: I want a cow that when I have got through with her I can sell her for a good chunk of meat. So they get that cow, and she gives them 2,690 pounds of milk per season. He buys this general purpose, or beefy cow, and pays more for her than he would for a cow bearing decided points of a milk producing cow. He would buy a cow making perhaps 150 pounds of butter per year in preference to one which would make 200 pounds a year, and why? Just because the dairy cow, like the race horse, shows certain peculiarities of outline and contour; she shows certain peculiarities in her general conformation, and they are not the peculiarities of conformation which go to the production of beef. The average life of a good cow is eight years, say; he refuses to take the cow which makes him $10 worth more of butter per year, and buys a cow with some 500 pounds more of meat, subjects himself to all the expense of supporting this weight for eight years, and what does she sell for when he has done with her? Three cents a pound; in other words he swaps $80 worth of butter, or its equivalent in something else, for $15 worth of meat, and then he says "I don't believe that keeping cows pays." Why does it not pay? It does not pay because he made the grand mistake of getting the wrong machine in the first place, and he pays for the consequences of that mistake all the way through. With regard to the dairy cow, I want to confirm a remark which was made by Prof. Robertson last night. He said he did not believe that the Danish cow was descended from the Jerseys and the Ayrshires, but that she looked exactly like a cross between those two breeds, and he accounted for it by saying that as she was a good dairy cow she approached to the same general conformation that those remarkable dairy breeds show. There is the secret of it; the dairy cow always comes to that particular conformation and contour, just as you see a general resemblance in the outlines and contour of the race horse. It is a machine which has to do a certain work, and therefore it has a certain form, build and organization. Now, what is that organization? We go back and classify it as the wise breeder does who looks into the physiological causes, and especially to the temperaments. The temperament of the milk producer is different from that of the flesh producer. For present purposes we divide the temperaments into two; first the nervous temperament—that which tends to the production of milk in cows and speed in horses; and, secondly, the lymphatic temperament—which produces beef in bovines and draught in horses. When we secure a good dairy cow we secure a cow with a high nervous organization. Butter is essentially a product of nervous force and energy, and I base that assertion on two or three distinct premises. The first one is that the organs for the production of butter in the cow are in themselves two of the most important pieces of nervous machinery in the animal. Here is the great mammary gland, the udder, which is united by the sympathetic plexus (referring to the illustrations) to the uterus. You notice how they are connected with the spine, the great nervous canal, which is itself in many respects merely a prolongation of the brain. The udder is attached to the uterus by the sympathetic plexus, as if you had two batteries and bound them together. It is in this delicate and yet powerful connection with the brain that you have the secret of the fact that the dairy cow requires particularly careful treatment. She is a nervous machine, a machine with a high degree of nervous energy; she is not dull and phlegmatic in temperament—if she is she is not worth much to you as a dairy cow. The first thing in judging a good dairy cow is to look to the brain, the seat of this very nervous energy which exhibits itself in the general outline and expression of the cow, and modifies the form. The dairy cow should have a broad muzzle—a narrow muzzle for the ox and a broad one for the cow, is a saying which is based on sound physiological principles. She should have a broad nostril with a fair distance between the nose and eyes, and a clean-cut face like a race horse. A broad, chucky face is undesirable in a dairy cow. She should have a remarkably large full eye, one of the most essential things to look for, as it is an indication of character and strength as well as of vitality and nervous force. You must remember that you make serious draughts on the nervous energy of the dairy cow; she not only produces butter, but protein and albumen and milk sugar, and all these are particularly vital in their character. The eyes of the dairy cow should be wide apart and prominent, giving a dishing effect to the face, not because of any lack of brain

in front, but because of the extra prominence of the eye. One of the most essential qualifications I have found as an indication of the vitality of the dairy cow is that there should be a strong junction of the spine with the brain. If the joining there is weak I have found that all other indications are valueless, because it indicates a loss of nervous energy which none of these other points can quite make up for. The spine should show full and strong from the neck through, and the shoulder should be fairly pointed. It is a bad feature in a dairy cow to have a round beefy or mutton shoulder. The back bone should rise pretty full going back from the shoulder, and you will notice that in this illustration, which represents one of the most famous of dairy cows, the backbone rises to an unusual extent at the crops. The chine, which is just back of the shoulder points, should show lean and not full and meaty. The back should show well and strong across the middle piece, because the weight of the whole of the lower body is suspended from it, and still more we see in this an evidence of a strong vital energy or nerve force. The looks or points of the hips should be fairly prominent, and the loin should be wide and thin but broad; a thick meaty loin indicates too much of a tendency towards beef. We come now to consider one of the most important parts of the make-up of the dairy cow. The object of the dairy cow's existence is maternity, and reflect with me for one moment on the broad meaning of that word. The beef cow is a miser, never giving off anything until she is slaughtered, but storing up constantly and refusing to give anything until she comes to the slaughter-house. The dairy cow is organized on a totally different principle—the great principle of maternity, and you can see what a vast difference this makes in the physiological conformation of the animal. Of necessity, then, the true dairy cow must show a relaxing tendency of form; she must be loosely built, not closely ribbed, the ham should be thin and all the hollows prominent. The inside of the ham or quarter should be well hollowed showing that provision is made for the udder. This is not a beefy buttock. The pelvis should be broad and open, the twist below the pelvis open and the word "relaxation" written all over her. In my own experience and observation I have never yet seen a good cow, a cow that was profitable to own, where the hold of the udder to the abdomen was narrow or weak, but I have always found that a good cow showed a broad development in that line. The very functions of the cow pre-suppose relaxation, and I have never yet seen a cow that was very closely built that was a good dairy cow, I don't care of what breed. Now, how many men ever think, when they are caring for their dairy cows, of the relaxed condition of the body, and how much that means? It means in the first place that by her nature and functions the dairy cow in the act of giving milk is necessarily relaxed in the conditions of her body. The man who stands her up against a wire fence, or sends her off to a creek or hole to drink ice-cold water in winter, and then expects that she is going to give him milk—such a man does not know the first principles of motherhood. He does not deserve to have a wife (laughter), and there should be a law to prevent it (renewed laughter). I would not allow a daughter of mine to marry such a man, because he never would understand that he was dealing with a mother. Now, this relaxed condition of the cow in giving up her milk pre-supposes a relaxed condition of body, and that fact calls upon every dairyman to surround his cows with those conditions which are best adapted to make amends for that. The cow shows this in her build, her form; like every other machine, she must be constructed with a view to the purpose which she is intended to fulfil, and therefore, having that relaxed form of body, she must not be considered hardy in the sense that a steer is hardy. A man once said to me, "Is that cow hardy?" "What do you mean by hardy?" "Well, is she tough?" Then I got to work and I proceeded to re-organize the man (laughter). The meaning of the word hardy I found to be, when used by such a man as that, the ability to bear exposure and abuse and privation and thirst and hunger, and give a little milk besides (laughter). Now, I appeal to you on your sense of chivalry and humanity and common justice, whether any man has the right to start out in this world with any such idea of the dairy cow? I say, no; and I am speaking this in all soberness and earnestness; it is one of the central ideas in our judgment of the dairy cow. One of the best indications of the constitution of a cow is the strength and firmness of the umbilical portion of the abdomen. My attention was first called to this matter during our war in 1863, when I saw a surgeon examining men for the United States army. I

enquired of him as to what was the constitutional basis upon which he rejected men, and he made this remark—that no matter how well formed a man was, if he was weak in the abdominal formation he went to pieces very quickly. I said, "Doctor, is that always true?" He replied, "I never knew it to fail"; and he was a clever old army physician. I said, "Does it apply to animals as well?" "I should judge so," he said, "I have never looked for it except in horses." He was a lover of thorough-bred horses, and he said he always looked for it in good thorough-bred horses and he always found it. I commenced to study it, and I found there was a marvellous deal of truth in it as regards the cow. The abdominal muscles should be strong and full, for you must remember she has to carry a tremendous weight in milk and water and food. She has to carry for you in the neighbourhood of 100 pounds of forage, and to do so she must not only have a strong back but a strong abdominal development, and if she has that, united with deep lungs, you may set her down as a cow with strong vitality of constitution. Again, in contradistinction to the beef form, we have the retreating brisket instead of the full prominent brisket. This is based on good physiological reasons. In the beef form we have a square block on four legs, the shoulder coming well forward giving squareness of outline, whereas in the dairy cow we have the retreating shoulder similar to that of the race horse. In the beef animal, such as is exhibited in this picture of a shorthorn heifer, you have the heavy flank, close, strong and well-set ribs, the mutton shoulder, the heavy neck, the hanging brisket, the advancing dewlap and the broad, square buttocks. All these are indications of different functions and a different temperament from those to be found in the dairy cow. With regard to this question of temperament, let me give you an illustration. I don't believe there ever was a man in God's world that thanked heaven so heartily that there had been some one who bred a thoroughbred horse as did your humble servant on one occasion. It was the battle of Cedar Creek, at the time when General Sheridan made his famous ride. Sheridan was absent at Washington, and the rebels bore down on us, cutting off one section of our army and then another and then another, until the road to Winchester was thick with stragglers, and there was a sense of discouragement all through our ranks. "We are gone! We are gone!" was the sentiment in every man's mind. I was in a battery of artillery, and I was ordered to move a section of it to a more advantageous point. For some months previously I had been riding a thoroughbred mare which I had captured, and, I may say by the way, that I captured almost everything I could find, particularly in the horse line. (Laughter). She was a thoroughbred in every sense. When I got her first she was extremely nervous, and had been used in such a way that she was very difficult to handle, but I had put her under a sort of Rarey treatment, and had finally succeeded in establishing friendly relations between us. I thought I would take a short cut instead of going about a mile to reach the battery. Well, I had taken what I supposed to be the shortest distance, but I found I had lost my way, and on jumping over a fence the first thing I knew I ran into a clump of cedars and was confronted by a rebel lieutenant and thirteen men, who saluted me with "Surrender, you Yankee son of a —— gun." (Laughter). Well, I was something like young Lochinvar —"'They'll have fleet steeds that follow,' said young Lochinvar." I thought it would be a shame for a man as well mounted as I was to be captured without at least giving them a race for it. I did not surrender, but I lay down on her, and I intimated to her very firmly that if ever in her life there was a time when she should show what two thousand years of careful breeding behind her was worth it was just about then. (Laughter). I found that the lieutenant behind me was nearly as well mounted as myself; the thirteen carbines of his men were discharged at me; I expected to get some of the contents of them, but I did not. My little mare put on her best speed, and led away along the turnpike with those tremendous long strides of the race-horse, her feet spurning the ground behind her, and I feeling that I was almost part of the gallant animal I rode. The rebel lieutenant followed closely after me, firing his revolver and calling out to me to surrender. But I did not surrender; I thought it would be a shame, particularly on account of the horse. (Laughter). We ran, I think about a mile, about as pretty a race as ever was witnessed, I believe, but I felt her gradually getting away from him with that tremendous staying power which is one of the most remarkable qualities of her breed. One of the grand facts in connection with that struggle was the fact that Phil. Sheridan in

that same battle rode a thoroughbred horse; and I remember well the appearance of that horse as it came up covered with flakes of foam, after it had carried Sheridan the twenty miles from Winchester to Cedar Creek. Where would the United States have been if it had not been for a thoroughbred that day? Yes, gentlemen, and where would Hoard have been if it had not been for a thoroughbred? (Loud laughter). I got away from my pursuers, and ever since then I have had a good strong belief in blood and breeding, and I believe in it most thoroughly and emphatically when I come to pin my faith to a cow. I know full well that if that day I had bestrode a succotash horse I would have met a succotash fate (laughter); and I know, too, that if in dairying I get a succotash cow I will get succotash results. (Laughter). You all know, for history has told you, how Phil. Sheridan came along that road, how cheer after cheer was caught up and carried along our ranks, reviving our hearts and carrying dismay to our adversaries, who said to themselves that reinforcements were coming; you know how our forces were re-organized, how they attacked the enemy, and that before night 10,000 prisoners were ours. I was sent as one of an escort of some of these prisoners, and I got acquainted with one of their number, a young lieutenant belonging to a cavalry regiment from Virginia. He was a pleasant, genial fellow, and I got well acquainted with him and did all I could to relieve him of the tedium of his rather dispiriting journey. As we were going along he said to me one day, "By the way, I had the devil's own race that day just before we were captured. I started after one of your fellows, and I thought I had a pretty good horse, but he was mounted for God's sake." Well, I said to myself, "I know one man that day who was pretty well mounted for Hoard's sake too." (Laughter). I said to the Virginian, "Did you catch him?" "Catch him!" he said, "No, but I would like to know where he got his horse, for I thought I had the best horse in Virginia; but he got away from me." I said, "Did this Yankee turn round and motion you to come on?" He said, "Yes, but what do you know about it?" "Well," I said after a time, "Shake: I'm the huckleberry that you was after." (Laughter). Well, he shook hands, and in a broken voice said that he was glad he had not shot me. We should remember in the judgment with which we select our dairy cow that this principle of heredity, this wonderful thing called blood, maintains its purposes and its power for our good. We should cultivate a larger and more profitable idea of the dairy cow than we do. (Applause).

The Convention then adjourned until half-past seven, p.m.

The Convention resumed at 7.30 p. m., the President in the Chair.

The President.—Ladies and Gentlemen.—I have now great pleasure in introducing to you Prof. I. P. Roberts, of Cornell University (applause.) This is not the first time he has been at our meetings. We all remember his previous visit with a great deal of pleasure, and he has always been recognized by our dairymen as one who could both interest and instruct them. He will read a paper on the question of food and water for the dairy.

FOOD AND WATER FOR THE DAIRY.

Prof. Roberts, who was received with applause, said: I have prepared a short paper on the subject mentioned by the President, but I shall not read it all to you, because you will be able to read it in the report of this Convention, and some of the detailed figures you would not be able to carry home with you by simply listening to it. The question of water and food for the dairy is a very broad one. Mr. Hoard has kindly and ably mapped out for us the ideal cow, such a cow as we would all like to have in our dairies. But such a cow as he has indicated means better food and better care; it means more intelligence in our farm operations, or even such a cow as that amounts to almost nothing. You have to feed her better, you have to care for her in every way. I start out with

this proposition, that the farmers of Canada and the United States want to run their farms for all they are worth, all winter long. Were it not that agriculture is one of the very best occupations, we would certainly swamp ourselves in a very short time by the method which most of us pursue at the present day. In the first place we will commence in the spring. Some of you have clover pastures, and if you have not you ought to have them, although clover is not the best possible food to feed a cow in early spring for producing milk, especially if it is to be converted into butter. We should commence right here to feed the cow some bran and it is best to feed it dry. I buy bran for $14 ; I feed it to milch cows, and the fertilizing material from those cows from that bran is worth, in commercial value, $10.

The PRESIDENT.—How much do you give them in summer?

Prof. ROBERTS.—From two to four quarts, right in the time of succulent pasture—that is clover pasture. There is no way in which you dairymen can feed so profitably as to give your cows bran in the summer time while they are pasturing ; if any man will try it for three years and report to me that he is dissatisfied with the experiment, I will pay for the bran. It is worth over $10 per ton to put it out as a fertilizer over the land. The trouble with too many farmers is that if they do not get back this $10 the first year they imagine it is not there ; but they would be sure to get it back in the second or third or fourth year. When I state this I am stating a fact ; I am not drawing on my imagination for it either. Such a system of feeding at Cornell University on seven acres of pasture has caused it to improve to such an extent that it now carries four times as many cattle as it formerly did. Now if that land was worth $50 an acre to pasture cows on formerly, it is now worth $200 per acre, in its productive value. (Applause). But you must not imagine that you are not making money because you don't find every dollar in the milk pail next morning, or every cent in the bank at the end of the year. Corn or cheese or cotton may be king, but I maintain that grass sits on the throne, and that fertility is the power behind the throne. We surmise that this abortion trouble in New York is caused by the exhaustion of some of the elements of the food of the cow. A quart of bran in the manger is a far cheaper way of getting a cow out to pasture than to board a dog. The point I want to get at is this : that when the pastures are very succulent, even Mr. Hoard's cow cannot feed so as to produce the best results ; the stomach cannot act at its best because there is too much water present ; but if you give her bran you will notice a very marked difference. Of course there may be other foods which will do it as well as bran, but I doubt it. Then again, along in the fall when the pastures are not at their best you should begin to feed it liberally ; you cannot afford to have a cow toiling late and early to get sufficient food for a bare subsistence; she is too expensive a machine for that. No man can afford to draw stones in his carriage ; it is too expensive. What shall we feed in the fall ? First of all, clover, which is now sufficiently matured to make milk that will produce butter. I recommend clover because it has the property of going down deep into the soil, and, as it were, pumping up the nitrogen from the soil. We have samples of clover at Ithaca with the roots attached which show that it went down 52 inches, one sample from a sandy soil, and another from a gravelly soil.

Mr. HOARD.—We have found cases in which these small roots go down fron 40 to 44 inches deep in a heavy clay soil.

Prof. ROBERTS.—The clover may be followed by field corn, with the best ears removed until it is time to place the cattle in winter quarters. Another important factor in the dairy is the water that we give our cows, and on this question I will read you some extracts from the paper which I have prepared.

The following is Prof. Roberts' paper :

No exact statement can be given as to the losses incurred by most dairymen because of the ignorance, or carelessness, or both, as to the proper conditions necessary to produce milk, beef and growth in young cattle in cold weather. In the dairy there should be no closing of doors for five months in the year for repairs. Such careful provision should be made for the welfare of the animals, that they will virtually be productive the

year round. Very marked shrinkage of milk usually begins in August on account of one or all of the following causes :—Insufficient or bad water, flies, poor and dried-up pastures ; rains, frosts and cold winds in October and November, complete the work begun earlier. Carelessness and ill-timed economy in the winter management complete the work of absorbing all profits and sometimes a part of the invested capital.

The object of this paper is to point out how the losses wholly or in part may be obviated. August supplementary food should be largely of bran, because it is convenient to feed, is a great milk producer, easily procured and a valuable fertilizer. Bran in ton lots sold in August for $14 per ton in Ithaca. Hay is worth $11 per ton at the present time. Two thousand pounds of bran will feed as far as three thousand two hundred pounds of mixed hay, while the hay costs $8.60 the most.

Second-growth clover, fodder-corn and the like, should be provided, but too often the clover is entirely wanting and the fodder, on acconnt of late and thick planting, is little better than water and wood pulp. It may serve a good purpose sometimes as filling, but what the cow wants is something that will stick to the ribs. After all, good field corn, with the better ears removed, is the best and cheapest fodder-corn raised. Fortify all rough foods with concentrated by-products. At present both oil-meal and cotton-seed mea are cheaper cattle food than timothy hay. I have known men who acted as though they thought the scientific way of drying up cows late in the fall, was to give them half rations of straw and poor hay, fill them up with cold water, and then turn them out in the open field or barn-yard to exercise, for fear they would get the gout. This method is certainly scientific and always successful. Is there any valid reason why cows should not give an abundant flow of milk for ten or eleven months of the twelve ? For at least one hundred years dairymen have been trying to warm barn-yards with cows and cold water; in no single instance has success been attained, yet thousands will repeat the attempt this winter, at least in a modified form. The highest success comes only through abundance ; abundance of food for both plants and animals must produce better results than semi-starvation. How to keep the milk flowing is one of the great questions of the dairy. The details of the answer must be as varied as are the farms, but the principles followed must ever be the same. Supposing the trying fall months have been passed safely and the cattle are in comfortable quarters, what policy shall be pursued—a liberal or a penurious one ? Here is one cow that eats thirty-seven and four-ninths pounds per day of hay, meal and corn-stalks, valued at thirty-two cents. She produces thirty-one and two-thirds pounds of milk, and eighty-nine and one-ninth pounds of manure per day, the former valued at forty-seven and one-half cents, the latter at sixteen and seven-ninths cents, total seventy-four cents. Another cow eats twenty pounds of straw and ten of hay per day, valued at eight cents. She produces, computing as above, manure valued at four and one-half cents, loss three and one-half cents per day as against, in the first case, a gain of forty-two cents; the first cow goes to the spring pasture strong and vigorous, the second has to be " tailed up." I leave it for you to decide which line of policy it is best to pursue.

Read Proverbs 11th, 25th, and then you will be in a proper state of mind to consider the details of combining various foods in order to make them appetizing. This word, be it remembered, is simply another name for digestibility.

The object then to be attained is, to get the animal to digest all that is consistent with health. In order to do this we must increase the desire for food, and at the same time increase the power of digestion. How shall it be done ? Why, tickle the palate—make the mouth water literally. So tickle the membranes of the stomach that they will do their work heartily and well. A happy stomach in a cow unlocks the puckering strings of her udder as effectually as a good dinner does those of a man's purse. When we place a highly relished food before an animal the salivary glands immediately respond by exuding saliva.

The appetite should be kept sharp for best economical results. Hence, meat animals should be fed but twice daily. Over-feeding clogs and stops the flow of the gastric juices and reduces the flow of the milk temporarily nearly as much as semi-starvation.

I believe, after having tried many methods, that the most economical way of feeding all coarse products, first-class hay always excepted, is to chaff and mix them with mor

concentrated appetizing food. The material should be moistened, not made wet, with hot water and fed twenty-four hours later, after the mass has become somewhat softened. Where the dairy is very large, and there are conveniences at hand, it may, in some cases, pay to expend more upon the preparation of the coarser foods. But for the ordinary farm dairy I believe that the greatest profit lies between the two extremes, and that general practice should conform to the methods I have set forth. Apples, potatoes, roots and silage, if not too acid, may always be used to great advantage in the winter production of milk.

Since the best of milk is over eighty per cent. water, and the poorest nearly ninety, one of the chief things to give a cow is water. It is not good economy to give it to her in a semi-solid state, as all efforts so far to make ice-cream inside of a cow have proved failures.

In November, six cows were selected from a dairy of twenty for the purpose of learning; first, the effect of giving warm water; second, to determine the quantity of water drank; third, the amount of hay, etc., consumed; fourth, the amount of manure produced; fifth, the amount of milk produced; sixth, the quality of the milk; seventh, the weight of the cows. The six cows were divided into two lots of three cows each. To lot one was given water, ranging from forty to forty-four degrees. The water of lot two was warmed to eighty degrees. The average time from calving of lot one was, counting to December 15th, 126 days. Of lot two, eighty-four days. The average weight of lot one was 1,092 pounds; of lot two, 1,107 pounds. Difference fifteen pounds. Each lot contained one two-year-old heifer, with first calf. After the cows had been in their respective places for eight days, and a sample of milk from each lot had been analyzed the experiment began and was conducted for thirteen days. Lot one, or cold water cows, drank 110 pounds of water; lot two, 120 pounds per cow and day. The greatest amount of cold water consumed in one day was 126 pounds; the least, 105½ pounds. The greatest amount of warm water, 134 pounds; the least, ninety-four pounds. Each cow received daily four pounds of bran and four pounds of corn-meal. Lot one consumed in thirteen days 1,099 pounds of first-class mixed clover and timothy hay; lot two, 965 pounds. Lot one consumed per day and cow 28.18 pounds; lot two, 24.86 pounds. The cows which consumed the warm water made a saving of nearly fourteen per cent. in the hay consumed.

	LBS.
Lot one produced of milk in thirteen days.....	1,058.42
Lot two " " " "	1,040.27

The thirteen preceding days the six cows averaged 26 9-10ths pounds of milk per cow and day. The thirteen days of the experiment they averaged 27.54 pounds per cow and day. Lot one produced of solid and liquid manures in the thirteen days 3,867 pounds; lot two, 3,980 pounds; total 7,847 pounds. In 1884, an analysis of mixed cow and horse manure with bedding, showed that it was worth $3.61 per ton. The following year an analysis of manure, made by feeding less concentrated foods, gave a value of $3.05 per ton. Computing the value at the lower of the two, we find that the manure made from the six cows in thirteen days, was worth $11.96, or a trifle over fifteen cents per cow per day.

Lot One.

Dr.		Cr.	
312 lbs. corn meal and bran.....	$2 76	3,867 lbs. manure at $3.05....	$ 5 89
1,099 lbs. of hay at $11.....	6 04	1,058.42 lbs. milk, .015.....	15 87
4,319 lbs. cold water.....			
	$8 80		$21 76
		Less.....	8 80
			$12 96

Lot Two.

Dr.		Cr.	
312 lbs. corn meal and bran.....	$2 76	3,980 lbs. manure at $3.05....	$ 6 36
965 lbs. of hay at $11.....	5 30	1,040.27 lbs. milk, .015.....	15 60
4,661 lbs. warm water.....			
	$8 06		$21 96
		Less	8 06
			$13 90

Receipts per cow and day, less cost of food in lot one, thirty-three cents; lot two, thirty-six cents.

From the above it would appear that the saving in warming water results in a less quantity of food consumed, rather than in increase of milk. It should be noted that all of those cows were kept in warm, dry stables, and were made as comfortable as possible and that the cold water from being drawn from the bottom of a large reservoir was but a little colder than forty-four degrees at any time. As the experiment proceeds it may reveal the fact that there is gain in quantity or quality of milk, or a gain in flesh. So far no benefits have been found in this short time, except those arising from the saving of hay.

Improved buildings should go hand in hand with improved methods of feeding. I doubt if anything would be gained by warming water for cattle if they are turned out in the open barn-yard. Certain it is that we cannot afford to warm the open yard with warm water, much less with milch cows. The first step on many farms is to gather the little separate buildings together; placing one in each corner of what is to be the large new structure. If more than four small buildings are to be used they can be sandwiched between the corner buildings. When the buildings are not long enough to close up the outside lines, fill in with something that resembles a high board fence. A good shape for a large barn is eighty by one hundred and twenty feet. These old barns thus brought together, are to have a good grout or stone foundation extending six inches above the ground and around the entire outside. If the barn is on sloping ground, and it is desirable to drive into the second story, construct a retaining wall about eight feet from the barn and connect it with the barn by a bridge. By this means light is secured on all sides, and the dampness which comes from stone walls is prevented as all the basement walls may then be constructed of wood. The boards of the old building which are not on the outside may be taken off, as there is no further use for them as weather boards. Next remove all floors, joists and sleepers and all sills except the outside one, and place flat stone under all posts that must remain. If any posts form serious obstructions support them by trussing in the story above and then they may be removed. There is now virtually a clear ground space of eighty by one hundred and twenty feet, this is cut up and divided to suit the wants of the owner. The entire area should be paved or grouted with stone or brick-bats, and the surface made smooth with cement, except where the cattle actually stand; here it should be planked over after a light coat of cement has been placed upon the compacted ground. The mortar prevents the moisture from rising, and the urine from descending. The planked floor does not absorb the heat of the animal as does stone and the like, and it is far more comfortable for the animals to stand upon. A few false studs, some straw or building paper and the old barn boards, spoken of before, nailed on horizontally inside, will make the first story warm and tight. The second floor should be made tight to prevent the escape of heat from below, and the falling of dirt from above. The horses may be kept on this floor provided it is made urine-tight where they stand. (For detailed description see former publication in regard to asphalt, paper and plank floor.)

The roof should slope from all sides; that is, there should be no gables or at least only a partial one at the end where the loaded teams enter. Twenty feet more or less of the outside of the entire building should be covered by a very steep roof. The centre of the building, about forty by eighty, may be covered by a flat metal roof, or one with

much less pitch than the lower steep section. By this method of roofing there will be available room for fully twenty feet in height, although the posts of the old buildings were not more than twelve or fourteen feet long.

Mr. MACPHERSON.—What is the highest temperature you advise?

Prof. ROBERTS.—We warm to eighty degrees, but there are others who warm as high as ninety, and I have not had experience enough in that to determine. As soon as you get the cows in a warm stable you don't want to warm the water, and all the food will go to make milk.

Mr. HOARD.—Have you found any practical difference in the yield of milk?

Prof. ROBERTS.—No; we found only a trifling increase in the milk; the difference is in the economy in the food, and Mr. Adams, of Wisconsin, claims a saving of one-third, but it is in the warm stables.

Mr. LEITCH.—Which variety of clover do you think best adapted for our latitude?

Prof. ROBERTS.—I am a great friend of the medium red clover, though I think from what I heard in Wisconsin, that the large English clover sends its roots far deeper into the ground than the medium does. If you are using clover to fertilize your farm, don't allow it to stand more than one year. Our investigations show that clover which reaches two years old, is only half the value in that respect that clover one year old is.

Mr. HOARD.—I have seen the common red clover, where it was kept for nine years, and they cut three tons an acre on it last year. But it was only kept until the first blush of the blossom; and was thus prevented from seeding. If you cut it then it goes on growing, but if you allow it to seed it fulfils its function, and it is then a biennial.

Q.—What is the best way of preserving manure?

Prof. ROBERTS.—I think it should be kept under cover until you can draw it out in the field. I think it is a good plan to mix horse and cattle manure together. (Prof. Roberts here illustrated his method of using land plaster in his stables for the absorption of liquid manure—a method which he said had been very successful with him, and he recommended it very highly to dairymen and others).

Mr. HOARD.—That is one point upon which I wish to say a few words. I never saw anything so complete in my life as the way in which land plaster acts as an absorbent and preservative of manure. I use about two barrels of this plaster per winter, which costs me $1.60 per barrel, and I would not be without it if it cost me $5. Every night my man takes about two or three quarts of it, and as he passes along, scatters it in the gutters behind the cattle and the horses in the stables. So completely does it absorb everything, that if you go into the stable in the morning, you would scarcely know that there were any animals there, any more than you would in my parlour. The principle of this absorptive power of land plaster is, that it requires about 500 times its bulk of water to dissolve it; that is one reason why some farmers make the mistake of sowing it in a dry time; they do not get as much advantage from it as if they sowed it in the spring, so that it might dissolve readily. We have a man in our county who has a very complete barn, especially for the purpose of preserving manure. It is in the shape of a parallelogram, ninety feet long and forty feet wide. It houses between sixty and seventy cows—the cows facing outwards. In the winter, every morning the doors are open, and a man drives right through the centre and gathers up all manure in a sleigh. It is immediately taken out to the meadow lands which he intends to break up the next spring; so that when the thaw comes it is dissolved and sinks down into the soil to supply food for the plant.

Mr. DERBYSHIRE.—Don't you think there would be danger of this manure running off the land, if the snow melted fast before the ground thawed out?

Mr. Hoard.—Yes, I think there is some danger of that, especially on side hills. There is one point more I will refer to. The owner of this barn to which I have alluded, has a fine spring not far from the barn, but you could not get him to water his cows there. He has seen the folly of that method, and right at one end of the barn he has a well, out of which the water is pumped by a wind-mill into a tank at each end of the row of cows. From the tank the water is carried into a trough made of grouting—a sort of cement made of stone, water-lime and gravel mixed together. Before the cows are watered, this trough is carefully cleaned out, and the water passes along in front of each cow at the temperature of the earth, which is fully as low a temperature as the cow likes. Each cow gets the quantity she wants; there being no boss cow to drive the weaker ones away, as in the ordinary method of watering cows. The stable is warm and comfortable; and if the weather is fair and fine he turns the cows out for a portion of the day, because he believes in giving them a certain amount of sunshine. The temperature of the water is about forty-eight to fifty degrees when it is pumped out of the well, but in the tank it becomes considerably warmer. With regard to the land plaster, I would strongly urge dairymen to try it, as a large number have tried it with us, and, like myself, they have found it to work well.

Q.—Would not lime do instead of land plaster?

Mr. Hoard.—No; lime is a disorganizer rather than an absorbent.

Q.—Would not dry earth answer the purpose?

Prof. Roberts.—It has the same property to some extent, but it is not nearly so great an absorbent.

Mr. Lossee.—I had a meadow on which I put some manure when there was a little snow on the ground, but in a week or two there came a thaw, and all the rest of that winter I could see the manure running across into my neighbours' fields. (Laughter.)

Mr. Derbyshire.—I suppose if it benefited your neighbour you would not object?

Mr. Lossee.—No; perhaps not, but I put it there for my own benefit.

Rev. W. F. Clarke.—Would Prof. Roberts kindly explain what he means by clover being kept only one year? Does he mean after the year that it is seeded down?

Prof. Roberts.—Yes; you first mow it once for the hay, and I may say that I always mow it the second time for the hay, and it is not difficult when you get the land right to get four tons of good, well-cured clover hay per acre.

Rev. Mr. Clarke.—I would like to have that point cleared up for fear of misapprehension. Some ten years ago I gave an address to this Association on this subject, and I so overdid it in the estimation of some members, by my earnestness in urging the matter, that one gentleman said I had clover on the brain, to which I replied that it was a good thing to have either on the brain or in the land. I am at a loss to understand what advantage there is in trying to keep clover so many years successively on the land. I should hardly think that that was good farm practice; I fear it would result in what is so well known in Great Britain as clover sickness.

Mr. Hoard.—Have you ever had it in this country?

Rev. Mr. Clarke.—No; I do not think so, but I think the gentleman you mentioned will come to it. I think that the experiments that have been made with clover, show that it is far more valuable when it ripens and goes to seed. Clover actually becomes a richer source of fertilization by ripening the seed than if it is mowed before it ripens, and I think that entirely the best system is that of allowing it to remain in the land only the following season after it is seeded down. The second season take one crop off for hay, and another crop for seed, and in what remains in the soil in the shape of dead and decaying roots and leaves, you have what is estimated to be equal to ten or twelve cart-loads of well rotted manure to the acre. With regard to the depth to which clover roots will penetrate the soil, I have myself taken them out of a clay soil into which

they had gone to a depth of four and a-half feet; and we have well attested cases in which in lighter soils the roots have gone even to the depth of twelve or thirteen feet. These little roots branch out into minute fibres, which act as so many pumps to bring the elements of fertility up from the sub-soil. In this respect a crop of clover is better than any sub-soil plough.

BRANCH ASSOCIATIONS, INSPECTIONS, ETC.

Mr. CASSWELL.—I think that the present would be a proper time to deal with the report which was discussed yesterday with regard to appointing inspectors and so on, as this is likely to be the last well-attended meeting we shall have.

The PRESIDENT.—Perhaps Mr. Derbyshire will tell us what has been done in the east with regard to the matter mentioned by Mr. Casswell.

Mr. DERBYSHIRE.—At our Eastern Association we felt the importance and necessity of having an improved system of instruction. We found that the instructors we had were unable to visit all the factories and do their work in such a way as to produce the best results. For instance, if they visited the factories in the spring the number of instructors should be large enough to enable them to visit the factories again in the fall, to see what results had been produced in the way of improvement, and whether their instructions had been followed or not. We found that they were unable to do this, and consequently we nominated a committee to call upon the Commissioner of Agriculture, in Toronto, hoping that the Western Association would take hold of the matter with us, and appoint a committee of their number for the same purpose, for we felt that without such co-operation we would hardly be able to succeed. Our idea was to have one instructor appointed for each twenty factories throughout the district, and then have one general supervisor, who would have control over the whole of them, these gentlemen to go to Guelph as a meeting point, and receive some general instructions from Prof. Robertson. If one of these general instructors were appointed for the east and another for the west they could go to Guelph and spend the necessary time to get ideas on the subject, and thus the instruction being of the same character in both the east and the west, we would be able eventually to attain a uniform standard of cheese, so far as this province is concerned. What we would like you to do would be to appoint a committee, and in conjunction with us to visit the Commisioner of Agriculture and endeavour to get more aid to carry on this important work. The great difficulty we have had in the past has been that while one-half of our factories have reached a very high standard, the others are behind in the quality of their cheese, and the result is that they hold down the average quality for the province, so that the cheese does not stand so high as if the quality were more uniform.

Mr. MACPHERSON.—I rise merely to confirm the remarks which have been made by Mr. Derbyshire. We find that the great necessity is to bring up the standard of those factories which are backward, so as to increase the general reputation of the province for producing a uniformly superior cheese. It is the amount of inferior cheese which finds its way into the market that depreciates the value of our whole product. One point Mr. Derbyshire omitted. The way in which we expected to have our instructors adopt a uniform system was that they should meet, for say a week, in some one large factory and work there so as to get at the same general system of making, and then they would be in a position to give instructions in that method to the other factories.

Moved by E. Casswell, seconded by Wm F. Clarke, and

Resolved—"That the appointment of a committee to co-operate with the Eastern Dairymen's Association in regard to obtainiug aid from the Provincial Government, to carry out the scheme of sending dairy instructors to the various factory districts, be referred to the directors with power to act."

The motion was carried.

ONTARIO CHEESE AT THE COLONIAL EXHIBITION.

The PRESIDENT said:—The next subject in the order of business is an address by Prof. J. W. Robertson, of Guelph, on "Canada at the Colonial and Indian Exhibition;" but before calling upon Mr. Robertson, I desire briefly to state what had been done up to the time that that gentleman took charge in London. Going back to the commencement, I may state that Mr. Derbyshire and myself met Sir Charles Tupper by appointment at the Provincial Exhibition, at London, Ont., in the fall of 1885, to consult with him as to what way a proper display of dairy products could be made at the Colonial and Indian Exhibition in the British metropolis in the following year. Beyond some correspondence on the subject, nothing further was done, until about the middle of December, 1885, when Mr. Derbyshire and myself, representing the Eastern and Western Dairymen's Associations, met Mr. Ross, Minister of Agriculture, in Toronto, in response to a communication from that gentleman, the Provincial Government having been requested by the Dominion Government to take charge of the exhibit of the dairy products at the exhibition. Mr. Ross wished to consult with us as to what was best to be done. We advised that, as far as butter was concerned, it would be impossible to make a display at the opening, because the exhibition, commencing in the beginning of May, was too early for fresh, newly-made, grass butter (hear, hear); that butter was not like wine—it would not improve with age; but that cheese was different, our finest cheese being made in September and October, and that there was still some cheese of the finest factories unshipped. It was also remarked that Sir Charles Tupper, having stated that the restaurants in connection with the exhibition would be under the control of the Commissioners, they would furnish an excellent opportunity, by supplying the dining and lunch rooms with this article, of giving the public an opportunity of tasting the quality of our finest goods, for, as every one knows, it is the invariable custom in England to eat cheese at lunch and dinner. We therefore recommended that six hundred boxes be purchased and stored until the spring, and shipped in time for the opening of the exhibition, for the double purpose of making a large, prominent and attractive display at the opening, and of their being afterwards available during the season for use in the exhibition restaurant. The cheese was accordingly stored, but before anything more was done with it, Mr. Ross invited the committee of your Association, consisting of Messrs. Cleverdon, Casswell and myself, and a similar number from the Eastern Dairymen's Association, and from the Creamery Association, to meet him in Toronto to consult for the purpose of appointing some person or persons to take charge of the exhibit in England. They recommended that Messrs. Macpherson, Casswell and myself be appointed for that purpose. Accordingly the cheese was shipped on the 4th of April, and arrived in Halifax on the 9th of April. It was therefore there in ample time for the "Milanese," a steamer of the Furness line, which had been advertised to leave that port on the 14th of that month, with goods for the Colonial Exhibition. This was the line of boats contracted with by Sir Charles Tupper for this special purpose, and such goods could only be shipped by that line. Unfortunately, however, time was evidently not made a part of the contract. Mr. Casswell finding it inconvenient to go to London, Mr. Macpherson and myself went, arriving in Liverpool on the 6th of April. We immediately proceeded to London, but we could find no cheese, nor could we get any information regarding it from the Exhibition authorities. In this respect our cheese was in the same position as a very large number of other exhibits, which had not arrived, and whose owners were equally at sea regarding the cause of the delay. The opening took place, but the cheese had not even then arrived. After some difficulty we sought out and found the agents of this line of steamers, and then learned for the first time that, instead of the "Milanese" taking the Exhibition goods, she had sailed from Halifax on the 14th of April, taking a cargo to Boston, discharging there, and reloading with Boston freight for England, having left at Halifax all the Exhibition goods, of which there were about 100,000 tons, including the cheese. The next ship of this line which touched there was the "Ulunda." She sailed from Halifax on May 5th, the day after the opening of the Exhibition (hear, hear), and arrived in London on May 18th. Mr. Macpherson and myself awaited her arrival, and

were present when she was brought alongside of Victoria docks, London, where we saw the hatches removed, and the cheese taken out. We found it in perfect condition, and caused it to be stored there until we saw what could be done with it. Up to this time we had been trying unsuccessfully to obtain an allotment of space, and for several days, even after the arrival of the goods, we were kept dancing attendance daily, without anything definite being done. At last Sir Charles Tupper was willing to allow us six feet, as the space on which to make the Ontario exhibit of dairy products. (Hear, hear and laughter). This was so absurdly inadequate that we could do nothing with it, and we refused to accept it. (Applause). We decided then to abandon an exhibit as far as the opening was concerned, and endeavour to make as large, attractive, prominent and efficient an exhibit in every respect as it was possible to do, in the fall of the year, and for this purpose Sir Charles Tupper promised that he would give us all the space that we might require, clapping me on the shoulder and saying, "Leave that to me, Ballantyne." Now, you may ask,—Why was it that Sir Charles Tupper would allow all the space you wanted in the fall, and would only allow six feet at the opening? I can only infer what was the reason, but I have no doubt in my own mind that the inference is correct, and it is this:—Quebec, simultaneously with Ontario, had been requested by the Dominion Government to take charge of a dairy exhibit from that Province. They had consented to do so, and Mr. Maguire was sent to England as the Quebec delegate, for that purpose. But they had nothing at all to make an exhibition with, and if Ontario had been allowed to make such an exhibition in the spring as we made in the fall, and public attention had been called to the fact in such a prominent and decided manner, and that there was nothing at all from Quebec but Mr. Maguire himself, the contrast would have appeared too great. (Hear, hear and laughter). I am sufficient of a politician to imagine the use which they saw might be made of this fact in the local elections of that province, against the Quebec Government. Mr. Macpherson and myself anticipated this difficulty from the very first, and to fortify ourselves in surmounting it, and to lead to a realization of the importance of our dairying interest, we made an appointment with Sir Charles Tupper to meet us at his office in Victoria street, so that we might explain to him the remarkable development and the present position of that industry in Ontario, and especially the cheese product. We explained everything to him about our success at the Centennial Exhibition in Philadelphia, and the International Dairy Fairs in New York in 1878 and 1879, and dwelt upon the fact that two instructors from Ontario had been employed in the largest dairy district in Britain, at large salaries. We also drew attention to the fact that the trade circulars were quoting our cheese at from two to four shillings higher than the finest United States cheese, that the cheese we had for exhibition was not excelled by two per cent. of the English Cheddars, and that we wanted this large exhibit as a basis for pointing out our advantages as a dairy country. We spoke also of the low price of land in Canada, and pointed out that the freight rates from Canada were almost as low as from the Midland Counties of England. To all this he listened most attentively, and appeared to appreciate our efforts in that direction. To ourselves personally he showed every kindness, but he would not give us one foot more than six feet (less than was given for the most insignificant articles, such as whisks, pails, etc.) This was ludicrously inadequate for the proper display of so important an industry, whose marvellous development in quality and quantity ought to have been clearly shown; and the only possible reason we could imagine for our being so cramped was that the comparison would be an injury to the sister province of Quebec. We left some of the cheese to form part of the fall exhibit, to show the excellent keeping qualities of Canadian cheese (a point of the highest importance); and the remainder was to be sold. It was then the season when markets and prices usually declined, still the cheese sold at fifty-six shillings per cwt., about ten shillings above the highest market quotation at that date, realizing a fair profit to the Government on their outlay. The remainder Mr. Robertson exhibited at the Colonial and also at the Kilmarnock show, and it was pronounced by experts to be the most perfect cheese they had seen, and superior to either English or Scotch Cheddars of the same age. (Applause). I am particular in referring to this, as you are aware I have been charged with having swindled the Government, by selling them inferior goods, involving a loss to the province of $4,500, and that the reason the cheese was refused

space, was on account of the quality. It was also charged that Mr. Macpherson and myself neglected to attend to it, and that we had a fine holiday trip at the expense of the province. Now, gentlemen, as to the quality, will you believe it when I tell you that this is the very cheese referred to by Mr. Moore, of Frome, and other experts, through the English press, as being of an extraordinarily fine quality? As I said before, instead of the Ontario Government losing money on it, they have made a fair profit. I wish further to say that my services have not cost the province one dollar, that I have not received anything for my expenses, and that the whole of these allegations are a tissue of unqualified lies, circulated by an unscrupulous press, doubtless for partisan purposes. (Loud applause). Otherwise why should I be selected as the object of these attacks, whilst Mr. Macpherson, Mr. Derbyshire, and all others who have had anything to do with the matter and who are equally responsible with myself and between whom and myself there was never any difference of opinion, were allowed to go scot free? My unanimous re-election as president, is doubtless your reply to these unqualified falsehoods regarding myself personally. (Applause). Further, let me explain what transpired after our return to this country, and then Mr. Robertson will finish the story. We reported to the Minister of Agriculture what we had done, substantially in the same language that I have addressed to you to-day. We informed him that it would be impossible for both, or indeed either of us, to attend to the fall exhibit, on account of our business engagements in Canada, and recommended that Prof. Robertson, of Guelph, be appointed for that purpose, as he was specially qualified to do at the fall exhibit what we purposed to do at the opening. Meanwhile Mr. Ross conferred with the committee, previously named, who unanimously endorsed all that we had done and concurred in our recommendation. Mr. Macpherson was appointed to select cheese in Eastern Canada, and myself in Western Canada; Mr. Hannah, of Seaforth, to select butter in Western Canada, and Mr. Derbyshire in Eastern Canada. These goods were duly selected and shipped to Mr. Robertson, and most ably and efficiently did he perform his duty in connection with the exhibit, having attracted more interest in England, not only to our dairying interest, but to our country as a whole, judging from the communications and editorials in the British press, than all other exhibits put together. (Applause). In this way through her dairy products Canada obtained a greater impulse, by way of free advertising, than through all the emigration agencies that had hitherto been employed. I have had to wait my time to make these explanations, and I only hope that the press will report them with reasonable fullness, so that the contradiction may be as widely circulated as the slanderous statements. (Loud applause).

Mr. Macpherson.—I rise only to confirm every word that Mr. Ballantyne has stated. I cannot understand how any person should say this cheese, when it landed in London, was not in good condition or was not fit for the exhibition, for it was without exception the finest cheese I ever saw—or as one gentleman expressed it, it was the most perfect cheese that ever landed in London. Mr. Ballantyne has gone over the ground so minutely that I have nothing more to say. We tried to do our best, and I think that after the whole affair is over you will say that the best has been done under the circumstances. (Applause.)

Mr. Derbyshire.—I may say that in the year 1885 I represented the Eastern dairymen, as President of the Eastern Association, and Mr. Ballantyne at that time happened to represent the west. As that gentleman has stated, we saw Sir Charles Tupper at the London Exhibition, and had an interview with him; we talked over the matter, but of course Sir Charles could not go into the details, knowing nothing about the space, or what we were going to exhibit, and he told us that if we would interview Mr. Wright in Toronto he would be able to give us all the details and any figures we needed in connection with the business. Mr. Ballantyne and I went to Toronto, and after some time we found Mr. Wright's office. We talked the matter over, but we found that he knew nothing more about cheese than this dairy cow which Mr. Hoard has described to-night. (Laughter). The consequence was that the interview was a failure. The next thing that happened was that I received a telegram from Hon. Mr. Ross, Commissioner of Agriculture, asking me to come to Toronto by the first train. I replied that I would be there in the

morning. Mr. Ballantyne, I presume, received a similar telegram, and answered it in the same way. I went to Toronto and met Mr. Ballantyne and we had an interview with Mr. Ross, who laid the matter before us, and showed us Sir Charles Tupper's letter, asking that the Ontario Government should take charge of the butter and cheese exhibits from this province. Sir Charles wanted an immediate reply, stating whether the Government would take hold of the matter and be responsible for a proper exhibit being made at the Exhibition, and of course Mr. Ross, before he answered that letter, telegraphed to the representatives of the two Associations in order to acertain their views. We advised Mr. Ross that there could be no proper exhibit of butter at the opening of the Exhibition, but that we would procure the very finest cheese that we could, and we recommended him to buy 600 boxes and store them in the meantime in some proper place in this country, because we could keep the cheese better here than in the old country, and that we should have it arrive in London about the opening of the Exhibition and have it placed there in such a way that we could show the world exactly what we could do in the manufacture of cheese. One thing which Mr. Ballantyne neglected to mention is this—that Sir Charles Tupper in our interview in London told us that he would give us the control, so far as supplying the cheese to the restaurant in connection with the Exhibition, so that every man of the thousands who would be going into the restaurant would have an opportunity of testing our cheese, and advertising its fine quality. However, I found that I could not go; they did not pay any expenses, and I had other business to attend to, so I nominated Mr. Macpherson, who was a director of our Association and had business in England, to go and represent me. As Mr. Macpherson is the largest cheese manufacturer in the world, running sixty factories in one combination, I felt that he would most ably represent the East, and he did so with credit to our dairymen and to himself. You know how capable Mr. Ballantyne was of representing you, and that he did not charge anything for his services. To sum up the whole matter I would simply say that if the same thing were to be done again I would give Mr. Ross the advice I did on that occasion without any hesitation; I would adopt the same course in every respect, employ the same means, and I would hope that we would arrive at the same results that we have now arrived at. We have received through our exhibit an immense amount of free advertising in the columns of the British press, and these notices, showing the importance of our industry, have gone all over the world. We advised Mr. Ross to send Prof. Robertson, whose abilities you all know, to take charge of the exhibit in the fall. He succeeded in making a display that did the highest credit to himself and to our dairy products; the display of our cheese which he made was one of the most prominent features of the exhibition. (Applause). Representatives of the press swarmed around it from all parts of the old country, to get particulars regarding it, and to look at the monument which he had built up, and to describe it for their readers all over the world. We all felt proud of the able manner in which he represented our Government and the dairy interests of our province. In conclusion I can only repeat that so far as I am concerned, if the same circumstances were to occur again, and my opinion were asked, I should give Mr. Ross exactly the same advice I gave him before. (Applause).

Mr. Lossee.—Though I do not wish to make any remarks in the way of fault finding, there are some matters in connection with our exhibit at London that I would like to say a few words about. At the meeting which was held, I think immediately after the convention at Woodstock, there was a committee appointed to take charge of this exhibit. That committee appointed Mr. Ballantyne, Mr. Casswell, and Mr. Cleverdon, as a sub-committee to act in connection with the matter while they were in England. Now as one of that committee I wish to say that we were never notified about that exhibit—or at least I was not, so that I don't think that the matter was ever properly in the hands of the Association. I want to clear the Association of any fault, and though I am not finding fault, I think if there is any blame with regard to this exhibit it lies between the Ontario Government and the appointments they made.

Mr. Derbyshire.—When I was telegraphed to I represented every one of the directors of our Association, being for the time the responsible head of that Association. Does Mr. Lossee mean to say that the proper plan would have been for the Minister of Agri-

culture, who was urged to give an immediate reply to Sir Charles Tupper, to telegraph to each one of the thirteen directors what to do in the matter? Would not his proper course be to do exactly as he did—telegraph to the responsible head of each of the two Associations representing Eastern and Western Ontario respectively, and get those two together to give their advice? If I had been required to call together the Eastern Association it would have taken at least several days to do so; it would have involved a considerable amount of expense, and even then they would not have been able to be of any assistance to the Minister. It seems to me that the Commissioner of Agriculture took the proper and the only practicable course in communicating with the representatives of the two associations to get their advice. (Hear, hear).

The PRESIDENT.—Mr. Lossee is under a misapprehension with regard to consulting the committee, as nothing was done and no step taken until we were appointed to take charge. We reported when we returned, and we recommended what we thought was best. I may point out to him that it was not the Association which was taking charge of the matter, but the Provincial Government, and as the files of the Secretary will show, I reported to the committee to which he refers all that was done. If Mr. Lossee was not at the meeting I, of course, am not responsible. The documents will bear me out in stating these facts.

Mr. LOSSEE.—Was not Mr. Parker on the committee?

The PRESIDENT.—No; the committee were Mr. Casswell, Mr. Cleverdon, and myself. The representatives of the two Associations recommended the parties, but nothing was done until the committee reported, and another meeting was held, and it was only on their recommendation that the action was taken. I will now call on Prof. Robertson to report as to what steps he took subsequently in connection with the exhibit at London.

[Prof. ROBERTSON then delivered an address on the subject, which will be found reported in the proceedings of the Eastern Dairymen's Association.]

Rev. W. F. CLARKE moved the following resolution, seconded by Mr. C. E. CHADWICK, Secretary of the Association:—

That the thanks of this Association are due and are hereby presented to the Provincial Government for its liberal grant and patriotic action in connection with the display of Ontario cheese and butter at the Colonial and Indian Exhibition in England last summer; also that the thanks of this Association are due and are now tendered to Messrs. Ballantyne and Macpherson for their efforts to make the exhibit a success, a result happily accomplished at length under the able supervision of Prof. Robertson, to whom also the Association, as in duty bound, would express its thanks.

Mr. CLARKE.—We are about, I suppose, to go before the Ontario Government to request a larger grant in aid of this Association; and I think the best way of helping to ensure the success of such an application would be to show a due amount of gratitude for what that Government have done for us in the past. I think they have acted patriotically in connection with the dairy interests of our province by making a grant of $3,000 to the two Associations. With regard to the second part of the resolution I wish to say a word or two. The President has referred to some anonymous attacks which were made upon him in connection with the Exhibition. Some of us may think that it would perhaps be as well for the Association to ignore these attacks altogether, but it must not be forgotten that very severe official criticisms were made on the action of these commissioners at the annual meeting of the Provincial Agricultural and Arts Association at Guelph. I listened to those criticisms myself; and I thought it was hardly a proper thing to indulge in them when those concerned were not able to give any explanation, although I must say, in justice to Mr. Derbyshire, that he showed himself in the fore front on that occasion, by doing all he could to remove the misapprehensions which were created to the disparagement of the commissioners; although on account of his not being acquainted with all the circumstances he could not put the facts before that meeting as they have been laid before you to-night. But in view of these official criticisms I think the Association is bound in some way to give forth to the country an expression of opinion on this subject. While we all felt that there were unfortunate hindrances to the success of the exhibit in the first place, I think we all felt that eventually, through Mr. Robertson's efforts, the exhibition was a complete success. With regard to what good effects we may

expect to result from this exhibition I think Mr. Robertson has stated our natural expectations very mildly. As some reference has been made to the honey exhibit, and as I happen to be a bee-keeper myself and take considerable interest in matters connected with apiculture, I may say that last week we had the annual meeting of the Ontario Bee-keepers' Association, and received the report of our commissioners who were sent there in charge of the display of honey. It will perhaps rather astonish some of you to learn that not less than forty tons of Canadian honey were on exhibition there, and not only was the honey sold in pennyworths, but nine or ten ladies, who were employed as saleswomen, were supplied with spoons to present a spoonful of our honey to all who would take it. So that if it was beneath the dignity of the Canadian Government to sell their cheese in pennyworths, it was much more *infra dig.* to present visitors with spoonfuls of honey in this way. I may mention, also, that after deducting all the honey that was sold or given away and after paying all expenses, the bee-keepers who sent their honey there received a fair price for their shipments, and the greatest gratification was expressed at the success of the exhibit. Our commissioners reported among other things that the city of London alone is able to take all our surplus of Canadian honey at good prices. I may mention, also, that a young gentleman who is here to-day, who has come all the way from Lord Vernon's dairy to study our dairying methods in Canada, and whose father is editor of a paper in Dublin, published in connection with the flax industry, has stated to me that England could take large consignments of flax from this country, if Canadians would devote themselves more than they have done to that industry. All these circumstances show that as the results of our efforts in connection with the Colonial Exhibition our markets are likely to be greatly improved, and that farmers, dairymen, bee-keepers and other classes, may be able to see the way for a vastly increased sale for the various articles they produce. (Applause).

The Secretary.—I have a great deal of pleasure in rising to second the resolution, and to express my gratification at the remarks which have been made touching the progress our country is making in the commercial markets of the world. I am sure that every gentleman here must have listened to the remarks of Prof. Robertson with a great deal of interest and pleasure. When we take into account the views that have been very generally entertained abroad with regard to the primitive condition of our country and our people, the remarks which that gentleman has made as to the impression which our exhibit created in England, show not only the progress we have made in developing our resources, but show also that the people of England are beginning at last to have something like a correct idea of the greatness of these resources, and the extent to which they have been developed. (Applause.) I have always said, and I shall continue to reiterate it, until I see a great change in the appearance of things, that as a people we enjoy the finest country on the face of the earth, the greatest civil liberty and political privilege and the greatest amount of social happiness that can go together to make a contented and happy people, and I trust we may appreciate those blessings and realize those privileges. (Applause). I would wish to impress on the heart of every man in this country, who has any patriotism in his nature, the necessity of our making the best use of these inestimable privileges by continuing to develop the resources of our country. (Applause). It is gratifying indeed to hear how successful that exhibition was, not only in connection with the great industry which we are met here to represent, but in other branches of industry which have been referred to here to-night. I only hope that greater efforts will be made to produce the classes of goods which are most in demand in the foreign market, and thus keep up the credit of our people in the markets of the world. (Applause).

The motion was then unanimously adopted by a standing vote.

The President.—I have simply to thank you for the vote of thanks you have tendered to myself, Mr. Macpherson, and Prof. Robertson. This proof of your confidence is, I am sure, very gratifying to us all, and it was especially gratifying, after the comments which have been made about the cheese that was sent to London, to heart he remarks which have been made to-night with regard to its excellence of quality and its splendid keeping qualities. (Applause).

The Association adjourned at 10.50 p.m.

THIRD DAY.

The Convention assembled at half-past nine, on Friday morning, the President in the chair.

The PRESIDENT.—I am sorry that Prof. Brown, who was to have delivered an address to us, is not present, but in his absence Mr. Hoard has kindly consented to occupy a short time in discussing some practical matters connected with dairying.

DAIRY EDUCATION AMONG FARMERS.

Mr. HOARD.—I would like to say a few words on the necessity of dairy education amongst our farmers, and I wish to make my remarks intensely practical, by showing where money is lost simply from a lack of education in dairy matters. By way of illustration I will take two counties in the state of Wisconsin, and I suppose what applies in Wisconsin will apply in a proper ratio in Canada. I will take the county of Waupacca, which produced last year in the neighborhood of 359,000 pounds of butter. The average price of that butter was fourteen and a-half cents per pound. The county of Waukesha produced a larger quantity of butter at an average price of eighteen and a half cents per pound. Now if the people of Waupacca county had devoted more intelligence, more study, more understanding to their industry, and sold the butter they made for the price that the farmers of Waukesha county sold theirs, it would have amounted to $23,000 to that county, and their total county tax was only $24,000. Now there was not a farmer in that county who, when he came to pay his tax but felt it a serious burden, and yet unconsciously the farmers of Waupacca county threw almost the whole of that money away, just by the lack of a little study and intelligence. Take, for instance, the effect of reading and studying upon the fortunes of two townships in my own county. Seventy per cent. of the population of Jefferson county, where I reside, are Germans; and we have towns there that are solidly German, and absolutely without a single American resident in them. Now those people do not read the English papers, and as a rule the German papers do not furnish them with the information on dairying matters which they require as food for study. What effect has that fact upon the fortunes of those people? The town of Watertown in 1885 produced 83,000 pounds of butter which sold at twelve and a half cents a pound. I have never had a single subscriber to my paper in that township, nor am I aware that any English dairy paper, or English agricultural journal of any kind, has any subscribers in the town of Watertown. The farmers there gain all the knowledge they acquire by the slow process of contact. Now in the town of Koshkonong—composed of a more mixed population and a more intelligent population—the town in which I reside, and where we have had for years 400 or 500 regular readers of dairy literature and other farm literature, there was produced in the same year 127,000 pounds of butter, as against the 83,000 pounds produced in Watertown, although Watertown is superior in the quality of its land; and that butter instead of being sold at twelve and a-half cents, averaged twenty-one and eight-tenth cents a pound. There is an excess of over nine cents per pound which is due not to the hardness of their hands, for Heaven knows the farmers of Watertown have hard enough hands; not due to the stiffness of their backs, because the farmers of Watertown are a stiff-backed generation; but due to nothing under the sun but that enlargement of the mind and that quickening of the intelligence which comes of reading and thinking, while the farmers of Watertown lost that difference in the price of their product by the fact of their taking advantage of those means of improving their intelligence and knowledge. Had the farmers of Watertown made the same quality of butter and the same quantity of butter that was made by the farmers of Koshkonong—and there was no reason connected with their soil or anything of that sort to prevent them—it would have made a difference of exactly $7,500

in the wealth of that town in the year 1885, or more than their entire county tax for that year. These are a few examples which will come home to all of you. In my observation I have discovered that a man's fortunes in this world are not dependent so much on the strength of his hands as on the strength of his judgment. Eight hundred years ago the forefathers of these old German farmers were serfs, who were bought and sold like any other article of trade. What is the difference between the German farmer of to-day and the German farmer of 800 years ago? Is it in the hardness of his hands? No. Is it in the strength of his brawny arm? No. It is in the enlargement of his brain and understanding. One day I met an old German friend of mine coming home from the county fair with a nice heifer. I said to him "Well, did you get a premium?" This old friend of mine is very much of a philosopher, and he said to me "Get a bremium? Do you know vat I dinks about dose bremiums?" "No," I said. "Vell," he said, "I dinks dot off a man gots de pest heifer in the vorldt und goes to the gounty vair, off he don't got a goot headt he don't got no bremium." (Laughter). This remark of his shows he knew the value of sound judgment and intelligence in administering the forces he applied to his work, and a very clear showing it was to me. The same old German came into my office on one occasion, just after I had received a reverse in fortune. I had dropped every penny I had in the world, and two or three thousand dollars more, in an unfortunate hop venture. I had started my little paper, and the old German came in to comfort me, and I shall never forget the powerfully cheering and invigorating encouragement he gave me, in his own quaint way. He said "Effery man's peesness is shust like a carrot. Dot carrot got a leetle end, und a big end, and off a man measure his peesness all the vile py the leetle end, den he shtay dere at the leetle end, but off he measure his peesness py the big end, py und py he got into dot place und he own the leetle end too." (Laughter). I have carried that comparison in my mind ever since. I have discovered that this meeting has not been attended very largely by the farmers who live about here, and though the weather is some excuse for their absence, there is evidently not that hunger for knowledge that the farmer ought to feel, if he wants to have a healthy state of mental digestion. Without that hunger for knowledge a man is always measuring his business by the little end, while with it he is always reaching for the larger view of his business. Now, how shall we reach these men who are not here, and how shall we stir them up? It is wrong to say that they are ignorant. The finest brains we have got to-day are to be found in the agricultural class; the finest brains of the nation are there. Take, for instance, the great pork packers, Armour Brothers; they were farmers' boys alongside of me; we went to school together, and fished out of the same pond. The only difference between us to-day is that I am worth the most money—in my mind. (Laughter.) To-day those rude farmer boys are handling a business of $100,000,000 or so. Now, no men in the world could stand the tremendous strain which a business like that involves, if there was not in the parent agricultural intellect a tremendously strong fibre and great native grasp and tenacity. I stood in the Board of Trade of New York with one of those men, looking over that vast body of men, controlling more wealth than any similar body in the world—controlling the commerce of all these millions of people—and he said to me, "How many of those men do you think are farmers' boys, born on the farm?" I said I had no means of knowing, and he astounded me by saying 80 out of 100 of them had been bred and born on the farm. That one fact convinced me, my friends, that the native intellect of our farmers was all right. We want its vigour, its virile fibre; it is required in every avenue of business throughout the world. But what shall we do to reach it, to stir and stimulate that sluggish indifference to the value of knowledge? The farmer is daily surrounded by men in his own line of business and largely of his own intellectual level, and instinctively he gets to measuring the world by that little domain within his own line fence. The consequence is that he works hard and reflects little, whereas if he thought more and worked less, if he studied and planned better, and did not work nearly so hard, he would find better fortune awaiting him. Charles Phillips, of the town of Lake Mills, Jefferson county, Wisconsin, amassed a fortune of $100,000 in twenty-eight years by straight farming, and never did any work himself. He was very badly afflicted with shaking palsy, and was not able to do a day's work; he had nothing but a common school education, but he had one of the most finely organized minds I ever

knew. When he died he owned 1,500 acres of the finest land in our county; he had sold $50,000 worth of grade Jersey cows to the rich men of Chicago, Milwaukee and other cities in ten years. He was altogether a wise and shrewd administrator of his interests, but he laid down his burthen and died when he was only fifty-five years old, leaving a fortune of $100,000. He had been elected to represent his people in our State Legislature, time after time, and was a man of splendid intellect and fine judgment. He was all his life an omnivorous reader. I never knew a farmer who was as great a reader and as great a planner and thinker as he was. The Saviour said, "Except ye become as little children ye can in no wise enter the kingdom of Heaven," and it is just as true with regard to the kingdom of knowledge. A man must have the child's receptive quality of mind; he must be willing to learn. Prejudice warps and distorts us and turns us wrong side up; we are standing wrong side up and we do not know it. I was standing in a hotel in Independence, Iowa, in 1868, when a man came in with one short leg, and walking up to the stove which was red hot—it was a bitterly cold day—he tried to warm himself, and to do so he had to twist himself into anything but a natural position. Another man who was quite drunk sat near by, and to his befuddled imagination it was the funniest thing in the world to see this man twisting himself round and trying to warm himself. After watching him for a while, with a keenly interested look on his face, he said at last, "M' friend, are (hic) you—are you a well (hic) man?" The other man looked up angrily, and said, "Yes, sir." "Ish that so (hic)—all sound and right?" "Yes, sir," replied the other very angrily. It was too much for our befuddled friend; he sat and pondered on it for a short time, and at last he said, "Well (hic) all I've got to say is, (hic) if you are a sound, well man you better get away from that stove, for you're (hic) warping like the devil." (Laughter.) Now, there is a moral in that story, and it is this—let us not be warped. Let us not live so close to our prejudices that we cannot take in the genial warmth of knowledge. This civilization that surrounds us to-day is a different thing from that which waited upon our fathers not so many years ago. We are enwrapped as with a garment with the environment of civilization. We have high-priced land, high-priced living; we have our boys and girls standing around us, demanding more and better knowledge than their fathers had. They are saying, I want to go to school; I cannot stay on this old farm, and lead a life of unthinking drudgery; I must have something to feed my brain. By and by the father bids his son a sorrowful good-bye, and the boy goes out into the world, he mingles in the maelstrom of life and commerce, and like enough he comes to grief. I am trying to show the value of a different policy to the farmers who live around me in Wisconsin. We have in Jefferson county, the produce of our schools and high schools and other institutions of learning, a number of young men who have turned to the farm, and who are, I am happy to say, among our brightest and most successful farmers. Their success is something which is very cheering and invigorating, for I want to see the farmers take to those studies which enlarge their views, and have their faculties stimulated and their knowledge increased, so that agriculture may no longer be a by-word and a reproach among the people. We must do something for our homes and for our families, and as the first step in that direction we must make more money. Without means the farmer cannot administer to these necessities of his home and family, he cannot fill his house with books and music and those other attractions which will satisfy the craving of his children for something outside the dreary routine of the farm, and he cannot have the means if his cows only produce 2,600 pounds of milk per year. He should have the cow that produces 5,000 pounds of milk; he should not have an impoverished acre of land on his farm; he should have the means of properly feeding and taking care of the cow when he gets her. On the contrary he should be able to do as Hiram Smith does, support 100 cows on 200 acres of land. I heard Mr. Oatman, of Illinois, give the figures of his business for one year, at one of our dairymen's conventions. He was a poor German boy, raised in the woods, and he went out to Illinois in the early days, and in twenty-five years he was in possession of one of the finest dairy farms in the west. On 204 acres of land his gross receipts from dairying last year amounted to $8,000. He carries 130 cows on 204 acres. He has forty acres of silo corn, and keeps two large silos. His net receipts are about $3,500, an amount which represents about fifteen per cent. on $20,000, or six per cent. on $50,000. He produces

these results by intelligently combining those two forces—a large working capital—a large number of cows—and a small primary capital. An old principle of political economy steps in here and gives us some insight—that is that the primary capital must always be subservient to the working capital, or else we get a lower return for the primary capital. By neglecting this principle too many of us do a very small business on a large basis; it is better to do a large business on a small basis. He starts out with the principle in which so many do not believe; he says that no farmer can raise a perfect ration for his cows. He cannot get what he wants from the farm, and therefore he must buy, and he buys bran and oil meal and gluten and so on—taking a little of everything that will stimulate and help the cow to a large production. Then in turn he sells pork that his skimmed milk has made, and a little corn, perhaps, and he has a surplus of hay. By this wise system of administration he manages off those 204 acres to produce $8,000 in gross, expending less than $5,000, never doing the work himself, but using his brains in administering the forces at his command. Let me give you an illustration from my own observation. A neighbour of mine raised a field of fodder corn this last summer, and in the fall, by my advice, he put one of those sweep rake reapers into it, and in less than two hours he had the whole two acres cut. Another neighbour of mine also had a two acre field, but he would not listen to my advice to get one of these reapers, but bending his back to the work in the old fashioned way, he went down one row and up the next, and on the evening of the second day he was still toiling away at it. I asked him what he thought of his plan as compared with mine. "Well," he said, straightening up and putting his hand to his back, "It's an amazing sight easier on the back, I conclude." "I had been taught how to do the work by the new plan, by reading about my old friend John Gould, of Ohio, who had used this reaper, and I thought that if they could cut corn in that way in Ohio two years ago I can do it in Wisconsin, so my neighbour got one of these machines and he found it to be a very useful one. It cuts the corn in little bundles, and we leave it a few days so as to get thoroughly dry; then we bind it and leave it there till December, letting it cure thoroughly in the fields. On an eighth of an acre this year I produced two tons of this product, and I would not trade one ton of it for the best timothy hay in the world.

Mr. Samuel Hunter.—Would you cultivate that corn?

Mr. Hoard.—Yes. In the first place after being planted we drag it thoroughly, and after it comes up we put on one of those slanting tooth drags and we drag it often when it is only three to four leaves high. I was afraid at first that it would hurt the young plant, but it will not hurt it a particle, and it kills the little weeds, and gives your corn a good start.

Mr. Hunter.—The common iron harrow would not answer, I suppose?

Mr. Hoard.—It does not do so well, because the teeth run straight. We have a harrow the teeth of which run straight when you hitch on one end, but by hitching on the other they run slanting.

Mr. Hunter.—How do you plant your corn?

Mr. Hoard.—With a single horse ensilage planter. Do you use a two-horse planter here?

Mr. Hunter.—We mostly sow with the seed drill, ploughing it in with the gang plough.

Mr. Hoard.—I may say that I have been making some experiments in the feeding of corn as fodder, and I find that I get the best results by using the feed-cutter; treated in that way it seems to give the cow more satisfaction, and it produces more fodder. By using the cutter I find that with my heavy ensilage corn I lose only ten per cent. of the entire weight, while if I feed it without cutting, I lose from thirty to forty per cent., as the stalks are so large that the cow cannot conveniently eat them.

Mr. Hunter.—Prof. Roberts spoke a good deal on the benefits of feeding bran. I am able to produce on my farm sufficient corn to feed as fodder, but I have wondered whether it would be better to replace some of the corn with bran.

Mr. HOARD.—I would advise you to do it. In all cases I would dispose of a portion of the grain I feed and buy bran, as it is astonishing what you can do with a mixed ration. For instance, here is a straw stack and a pail of oil meal; a cow will starve to death on either the one or the other, but just unite them in a proper ration, and she will thrive handsomely.

Mr. HUNTER.—I keep twenty dairy cows, and I feed roots pretty heavily. My idea is that with roots, chopped oats and barley would be better than bran.

Mr. HOARD.—Perhaps it would. You will find that in summer feeding two or three pounds of bran a day will help you immensely, and greatly increase your production of butter.

Q.—What do you think of Swedish turnips for fattening cattle?

Mr. HOARD.—I could give you no opinion on that, as I never fattened an animal in my life.

Mr. M. S. Schell, Woodstock, then read the following paper:—

PROFITS OF DAIRYING AS COMPARED WITH FAT STOCK.

Among the various branches of Canadian agriculture, there are none that have been so fully developed during the last few years as those of dairying, and the raising and feeding of beef stock, so that to-day they occupy a foremost position in importance among our agricultural exports.

And from the special adaptation of our climate and soil, and the degree of excellence to which we have attained in both departments by individuals, and in localities where these industries have been made specialties in our farming operations, we have every reason to believe that they will continue to be the growing industries of our province.

Many have been the discussions on the relative profits of beef production and dairying, and various have been the conclusions arrived at.

For an advocate of stock raising for the production of beef to claim that it is more profitable than dairying, or *vice versa*, for the dairyman to claim the same in regard to his branch of agriculture without any reference to, or allowance for, the varying circumstances, surroundings, or conditions affecting the agriculturists in different parts of the country, without taking into account the rise and fall in prices, as regulated by the question of supply and demand in the leading markets of the world, would certainly be too broad a statement for any practical use, yet such are the meagre statements that enthusiasts in the different departments are wont to indulge in.

That the raising and feeding of beef cattle during the last few years has been a profitable branch of Canadian farming, and in some instances largely so, is universally admitted, although that conclusion is arrived at by different methods of calculation and on different grounds. But the number of those who have made a direct profit in beef production, after allowing market value for all the feed consumed from the birth of the animal till ready for the shambles, we are bound to state without fear of successful contradiction, is limited to a very few instances indeed.

On the other hand, taking the returns to the dairymen during the last ten or fifteen years, or even longer, in those localities where the dairying industry has been made a specialty in farming operations, we as confidently assert that there are very few dairymen but have realized a direct profit over and above the value of the feed consumed. Yes, even more actual profit than what has been realized from any other branch of their farming operations. And as the strongest possible evidence we can get bearing on the point is from those who have had years of practical experience in the business, we have it in the fact that, where the dairying industry was first cradled, it is not only followed as the leading agricultural industry to-day, but is obtaining a firmer foothold from year to year.

And what is more, in many sections of the country where beef-raising was extensively followed for years, cheese factories have been built, and are so largely patronized that beef production in anything like a regular business, is fast becoming a thing of past.

That great advances have been made during recent years in the matter of raising and feeding beef cattle, in order to realize a profit all will admit. But the multiplied testimony of buyers and shippers all points in the direction that the rank and file of our farmers, have been breeding and indifferently raising an inferior class of cattle commonly called "scrubs," which, for beefing purposes, or in fact for any other purpose, are invariably raised at a direct loss. For a cattle beast to be raised and kept till it is three years old, and sold for from $30 to $35, and in many instances for less, even though it be sold off the grass, is certainly an unprofitable business.

Yet it is a fact, that by far the largest percentage of our young cattle are bought at from two and a-half to three cents per pound by the butchers throughout the country, for the supplying of the local demand, or else bought up as store cattle and shipped to Toronto, Buffalo and other markets, while the prices realized have certainly been unremunerative, although they were possibly as much as the markets would warrant the buyers in paying.

But some will argue that if those cattle had been fed by the farmer until fit for exportation to the British markets, they would have left a profit to the producer. Now we must admit that to be just the hinge point upon which turns the matter of profit and loss in feeding fat stock, providing due care has been exercised in the character of the stock raised. Not so much that a direct profit will be realized over and above the cost of production, allowing market value for the feed consumed, but indirectly by adopting a liberal system of feeding, by converting all the coarse feeds into money on the farm, and in so doing return the manure product back to the land, thereby maintaining, not only a high state of fertility, but increasing its productiveness from year to year.

Doubtless the question of early maturity is the one that has received the most prominence, and justly so, in the matter of raising and feeding cattle for the production of beef. Every day it is becoming more and more evident that the early and rapid development of animals intended for the shambles, is attended with the largest direct profits.

It has been frequently tested and established as a fact beyond all controversy, that a much greater gain per day is obtainable from a young animal, than from one that is at all developed, and that at a much less cost proportionately.

Or if a calf has been allowed at any time to become stunted in its growth, it will never become as good or as profitable a feeder as it otherwise would have been had it always been kept in a thrifty, growing condition.

Now we do not intend, nor do we deem it necessary, to enter into a discussion of the principles and conditions underlying what in the highest sense is understood as good and profitable feeding of fat stock. Our object is rather to give as correctly as possible the conclusions arrived at by different authorities as the result of years of practical tests by breeders and feeders. In regard to the actual cost per pound of beef production from the day of birth till ready for the butcher, at say three years of age, we cannot do better than refer to Professor Brown, than whom there is no higher or more reliable authority on the point in question, in the province.

Professor Brown, after conducting a large number of experiments with the utmost care and attention with regard to the exact market value of the feed of all kinds consumed, gives it as the result of his extended observations, that the actual cost of beef production is from eight to nine cents per pound, showing an apparent loss of from two and a-half to three cents per pound. As an offset to this, he estimates that the advantages in converting the feed into money on the farm, thereby utilizing much of the coarse feed that would otherwise be unmarketable, saving much in the way of teaming, together with the money value of the manure product, would be sufficient to counterbalance the apparent loss between the cost of production and the selling price of the beef. And be it observed here, that in no case does he claim a direct profit, but indirectly by using up the feed at home, thereby enriching the farm. Now, it may well be asked here that if a high grade of cattle, under favourable conditions and with the best of care, have not given

larger returns, what has been the result where an inferior class of stock has been reared and indifferently cared for? We think there can be but one answer, viz.: that in all cases they have been raised at a decided loss. But some may say that money has been made, and can be made, by buying cattle in the fall at from three to three and a-half cents per pound, and feeding them for the export trade.

Having had considerable experience in that line, we feel that we can speak with confidence in assuming that comparatively few indeed have realized a direct profit, over and above the advantages in converting the feed into money on the farm, looking to the manure product for the profit. Mr. John Geary, of London, and Mr. Rennie, of Fergus, both of whom have had a large experience in this line, appear to look upon the matter in very much the same way.

Mr. Geary remarks: "That his chief object is the manure, and if he makes the value of the manure his profit he is perfectly satisfied."

And were it not that an increased price of from two to two and a-half cents per pound, over and above that paid in the fall, is realized, depending on the increased weight of the animal alone would undoubtedly be a losing speculation. On the same principles we claim that the farmer who raises an animal and sells it at three cents per pound, does so at an actual loss.

Let us now turn our attention to the other side of our subject, viz., "The Profits of Dairying."

When we compare dairying in Ontario to-day with what it was but a few years ago, and observe how rapidly it has developed in importance as a branch of Canadian agriculture, how the value of the exports of cheese alone have increased from a few thousand dollars some eighteen or twenty years ago, to over $7,000,000 at the present time; how the quality of our product, as a whole, has become of such a high standard as to be placed on a par with the best of English and Scotch cheese, surely these are arguments speaking to us louder than words, testifying clearly and beyond doubt that the farmers of our province believe it to be a profitable industry. And in reference to the future we, as Canadian dairymen, need not entertain much fear of there being an over-production of dairy products, for many years to come at least. Dairy statistics go to show that there is a constantly increasing demand, both for cheese and butter, quite up to the increased production, and especially so for a fine article. But, what is more, and what should serve as a stimulus to Canadian dairymen, is the peculiar adaptability of our soil and climate for the production of the finest quality both of cheese and butter, and the high degree of perfection to which the art of manufacturing has been brought throughout the province, as evidenced by the high position accorded our dairy products at the Indian and Colonial Exhibition, when brought into competition with those countries that have been looked upon as occupying a foremost rank in the production of those commodities.

And just here we think is wrapped up a very strong argument in favour of dairying as a future industry of our province as compared with the raising of fat stock, as shown by the foregoing advantages possessed by us, and the limited extent of the area that is able to compete with us on equal footing in the production of cheese and butter. And also on the other hand that while we can produce the finest quality of beef, yet there is an almost unlimited extent of country, notably the Western States and the North-West Territory, that can raise just as good beef and at a much less cost per pound, so that even at the present time it is becoming a problem of vital importance whether fat stock production for profit in Ontario has not seen its brightest days.

To demonstrate the profits of dairying let us take a cow, for instance, that will give, say, twenty pounds of milk per day for nine months and we have 5,400. Allowing ten and one-quarter pounds of milk to make a pound of cheese, and taking the average price realized for cheese during the last three years, viz., nine and two-third cents per pound, and we have $50.90. And deducting one and one-half cents for the cost of drawing and manufacturing the milk, and allowing $3 for milking, and we have still $40 left.

Now, the cost of feeding a cow for a year is not so easy a matter to determine; but we think allowing $1.50 per month for six months' pasture, with fifty cents per month for

supplementary food during that time, and $2.50 per month for winter feeding, which, in all, would amount to $27, would be quite sufficient to cover the value of the food consumed. Such being the case, that would leave a direct profit of $13 per cow.

But the above is only one part of the profit, for we have the manure as an indirect profit, just the same as from the production of beef. It is not so rich, probably, in fertilizing constituents as that realized from an animal fed for beef during the last few months while the animal is being finished off for market, but possibly quite as valuable as that obtained during the first two winters' feeding while the animal is in a growing condition.

Another very important consideration which, to our mind, gives dairying an advantage over fat stock raising is evidenced in the fact that cows can be wintered successfully on a much larger percentage of coarse and non-nitrogenous food than can young and growing stock. And as most farmers have a superabundance of coarse foods, as straw of various kinds, corn fodder, etc., it is therefore clearly to be seen that these foods can be much more economically and profitably fed to cows.

But, perhaps, some will say that 5,400 pounds is too high an estimate to make regarding the yield of milk per cow. Now, we are in a position to state that there are many herds that could show quite as high a record, and can give individual instances where large herds have given considerably larger returns for a like period. But as our subject contemplates our dealing with things as we find them exemplified in the every day experience of dairymen we have taken a smaller return and included the whole of the year's production.

Many farmers send milk to the factory but six months in the year, and for a length of time in the early part of the season keep a considerable portion to make butter or raise calves, and through the whole season keep enough milk for family use, with the Sundays' milk besides, and when the season's returns are made out it is found that 3,000 pounds represent about the yield of the average herd, while in reality, if the whole flow, including Sundays' and the other three months' milk were taken into account, there would be fully the 5,400 pounds obtained.

It will also be observed that we have taken the average price of the last three years as a basis to figure from, which included one of the dullest years for the cheese trade that we have had for many years, whereas if we had taken the price that has been realized some years, we would have a much larger profit to show.

Now, we think any candid mind will admit that taking, say, three years' returns from a cow, which would be $120, she must undoubtedly show a larger profit than what could possibly be realized from an animal fed for beef, during a like period, as it would be necessary to feed in order to realize $120, or from the feeding of two or more head to receive a like return.

Regarding the possibilities of attainment in the realm of milk production we will not enlarge or speculate on what may be in store for future development; but simply mention a few individual instances touching the matter, that may serve as an incentive to others to endeavour to obtain like results.

While attending a local convention of dairymen in Norwich last winter we were pleased to learn from Mr. Graham that his herd of sixteen cows had given a yield of some 5,700 pounds each during the factory season of about seven months; and also at Ingersoll at a similar convention, when this question was under discussion, Mr. William Nanceskivel incidentally remarked that he knew of a herd of twenty cows that had averaged 6,000 pounds each, which we afterwards learned to be his own herd. Mr. Francis Malcolm has also been frequently quoted as having been the possessor of a large herd that had given him a return of 6,000 pounds per cow. And again Mr. D. M. Macpherson, of Lancaster, estimates that the standard of the dairy cow can be raised to 6,000 pounds per season, and when we consider his large experience and connection with the dairying industry, his opinion should have much weight.

And many other instances might be cited to show that the possibilities of production are far in advance of what has been obtained by the majority of our dairymen, but at the same time is quite approachable by all, if they would but use the means within their reach.

In order to attain this end the breeding and rearing of cows for the dairy should receive our careful consideration, as the profits of dairying are largely dependent on the character of the cows kept, and their capabilities for the production of a large quantity of milk from a reasonable amount of care and feed, such as the average of farmers can give their dairy stock.

The dairyman who desires to keep up a good herd must follow out a well defined line of action, never losing sight of the one great object aimed at. That a large percentage of the cows of our dairy herds are very inferior and kept at a loss is universally admitted. But the number of farmers who studiously and persistently apply themselves to the task of improving the general character of their herds is comparatively small indeed. That may seem to be rather a strange statement to make, but any close observer who will take the trouble, or who may have occasion to drive through the country, and see the character of the stock kept for breeding purposes, and also observe the starvation process by which the calves are reared, so that even what might have been the making of a good animal is so stunted and dwarfed as to be constitutionally injured for all time to come, will, we think, inevitably arrive at the same conclusion.

As to the cheapest and most effectual way to improve the milking qualities of our herds we would advocate :—(1) That none but sires that are known to be of a good milking strain be used. Our preference would be for a Durham of the Princess family and Bates strain. (2) Endeavour to have a few of the best milkers calve early, say in February or March, and raise the heifer calves from these cows, on the principle that "like begets like." (3) Adopt a liberal system of feeding all along the line, as the stamp of a cow raised will depend very largely on the care and feed given her during the first two years of her life. If the calves are born and cared for as advocated they would do best to come in the following spring after coming two years old.

With close attention in the line indicated our herds would be vastly improved, and the profits reaped in corresponding ratio.

Canadian dairymen have much to be proud of, but we believe there are grander opportunities yet in store for us. May we prove ourselves worthy of our position in developing one of the most profitable branches of Ontario's agricultural industries.

Mr. Hunter.—Have you had any experience in the different dairy breeds? I understood you to speak favourably of the Durham.

Mr. Schell.—My own experience has been limited with regard to the different dairy breeds, except in the line of the shorthorn. I have always had that breed, and I have had individual instances among them of exceedingly fine milkers—larger returns, I think, than have been obtained from other breeds. The Ayrshires are a fine milking breed, but I do not think they can furnish individual instances of as large a return, and our object is to realize the best herd in the shortest possible time. For that purpose I do not think we have any breed in our country that we can use so well to increase the flow of milk with the cows we now have as the shorthorn. I think they cross better with our common cows than any other breed, though of course I know it is difficult to find those strains of the Durham that are good for milking at present, as we have been paying so much attention to the development of beef. We know, however, that such strains can be obtained, and we have some breeders who are making a specialty of raising that class of stock.

Mr. Hunter.—Are you taking into account the cost of producing the milk as compared with the return, because there are differences there which must not be lost sight of. Individual instances do not prove the rule, because we can find remarkable cases of milk production in almost any breed. But the point that should be looked at is the profits over and above the cost of feeding.

Mr. Schell.—I think perhaps that the smaller breeds will give a larger percentage of milk for the amount of food consumed, though I have not had much experience. My position is that we can improve our herds more effectively, more rapidly and more profitably by using the shorthorn cross, than by any other.

Mr. Hunter.—According to what Prof. Arnold has told us of his observations in England, the Durham, or the grade Durham, is the dairy cow in the Midland counties, and he showed by figures that if we fed our cows at the same cost that they did there, we would soon become bankrupt. The cost of feeding those large cows would not be made up by the returns in milk. I understood him to say in effect that they were not dairy cows.

Mr. Schell.—Yes, so I understood him.

The President.—Did you hear Mr. Hoard's description of the dairy cow?

Mr. Schell.—Yes.

The President.—You would hardly use the shorthorn to produce that type, if it is the right type for dairying.

Mr. Schell.—I know that is not a common type among them, but at the same time we are aware from public reports that there are shorthorn strains which have a high record for milking. There is a breeder in Scotland to-day who is specially breeding shorthorn strains for milking.

The President.—My experience is that if you cross an ordinarily good cow with a shorthorn bull the first cross will usually be a good milker; but the nearer you get to the thoroughbred shorthorn the more you lose in milking qualities. If you mean by improving the breed, producing larger animals, with an aptitude for fattening, you will get such an animal in that way; but though I am breeding shorthorns I would be very sorry to pretend that they are a dairying breed. They are not a dairy breed, for they have been bred for many years for the purpose of producing animals with an aptitude for fattening and arriving at early maturity. It is true that some of the best milkers are grade shorthorns, but you will find that in such cases the mothers were from milking stock, and if you go on to another cross, you will generally find that they are not milkers at all.

Mr. Hunter.—Don't you think there is some care and judgment required in raising gradé Durhams for milking purposes, in not forcing them too much to feed when they are young?

The President.—I believe there is a good deal in that. Reference has been made to the Ayrshires, and probably, taking them all in all for cheese-making purposes, there is no breed equal to them. They are a small hardy breed, and in the old country they are bred as a rule by shrewd dairymen. They are kept thrifty, but there is no forcing in their feeding, and I think our Ayrshires have been injured materially because our breeders have been aiming at producing a larger animal to please the public, with the effect of injuring their milking characteristics. In the old country they take care not to feed them high for fear of developing an aptitude for fattening.

Mr. Casswell.—I know of an instance in one neighbourhood where a man brought in an Ayrshire bull of a good strain to cross with the native cattle, and though that was a good many years ago, wherever you find cows descended from that bull you invariably find them to be good dairy cows. That impressed on my mind the fact that no better cross than the Ayrshire could be found for our common native cows to produce large milkers.

The President.—I may say that I am not interested in the Ayrshire breed to the extent of a dollar; but we bought two Ayrshire bulls fifteen or sixteen years ago which we used with the common grade cows. Up to that time Durhams had been used, but I must say that the heifers which were produced by crossing the common cows with those two bulls were the best milkers I ever knew. There is no doubt that the general rule is, although there may be exceptions to it, that if you continue to use pure shorthorn males you will get further and further away from milking cows.

Mr. Lossee.—My experience has been that if a heifer does not come in at three years old she inclines to run to beef, and I never saw a good milk cow commence at three years old.

Mr. HUNTER.—I think that remark holds good with regard to any breed—that is that they should come in early. You are apt to force beef even on Ayrshires after they are two years old.

MR. LOSSEE.—The best milkers I have ever had were a cross between the Durham and our native cow.

The PRESIDENT.—I will just add to what I have already said about the Ayrshires that in the old country, where they are raised, they do not force them. The young cattle generally run out on the hilly and rather poor pasture land. On our pastures you cannot give them even ordinary care without their inclining to get a good deal fatter than they do there.

Mr. SCHELL.—Mr. Lossee's experience confirms my view when I advocated a crossing of the shorthorn on our native cows. The best herds I have known are those produced by one cross of that kind, and I think that will be the experience of those who have watched the matter closely. I do not by any means think it would be wise to breed up close to the pure Durham for milking purposes, but I believe the method I have mentioned to be the quickest way of getting a herd of milkers, under ordinary existing circumstances.

Mr. CASSWELL.—Some of the cows which I referred to, produced by the Ayrshire cross on the native cattle, brought as high prices as $120, $140, and $175. One of them produced 6,000 pounds of milk a season; she was bought for, I think $150, but the owner said she was the cheapest cow he ever had.

Mr. HUNTER.—I was rather astonished to hear Prof. Robertson say that a cow would consume a quarter of a pound of salt per day, and I would like to ask him if he considers that dairy cows require as much salt in the winter as they do in the summer time?

Prof. ROBERTSON.—I have had no experience by weighing the salt during the winter time, but I think that during winter, as in summer, if a cow has access to salt all the time she will take just enough and no more than she needs.

Mr. HUNTER.—My experience has been that in summer time, and especially when on the early grass, cows require a great deal of salt, while later on they require less, whether on account of the dryer feed or not I cannot say. In winter I frequently offer my cows salt at regular intervals but for considerable periods it sometimes happens that they will not take it at all. I am rather careless about salting in winter, as it seemed to me that the cows did not require it.

Prof. ROBERTSON.—Do you salt your hay?

Mr. HUNTER.—Sometimes I salt clover hay, but not timothy.

Prof. ROBERTSON.—Mr. Hunter, I believe, is right about cows not consuming so much salt in winter as in summer, but at the same time I think it is only justice to the cow to allow her to have all she wants either in winter or summer. I found that one-quarter of a pound each per day in summer was all that they required.

BOXING AND CARE OF CHEESE FOR THE ENGLISH MARKET.

The PRESIDENT.—Prof. Robertson has some remarks to make on the subject of the boxing and care of cheese for the English market, as the result of his visit to England.

Prof. ROBERTSON.—I learned from my visit to England that much cheese, which was otherwise a good and saleable article, did not bring as much as it should have brought, on

account of its not being properly handled in preparation for shipment. In the first place, let me say that cheese-makers should be careful to have a perfect rind on every cheese. It costs nothing in material, and very little in labour, but it is worthy of paying attention to. If cheese has an imperfect rind its value is lessened about four shillings per cwt., regardless of its quality.

The PRESIDENT.—What is the cause of an imperfect rind?

Prof. ROBERTSON.—I find that a great many causes may operate to produce an imperfect rind. I will state how the evil may be avoided:—The cheese should be clothed and the cloth pressed on and left on the cheese for at least two weeks after it is put in the curing-room, and then after the cloth is removed the greasing of the rind will give it a bright and uniform appearance. In that way cheese is preserved against flies and maggots. The cloth should be large enough to lap over a little. Cheese should always be turned in the press in the morning, as that has the effect of giving it a more solid body, a finer appearance, and a better rind. Then, with regard to scale boarding cheese, it is not enough to throw in one or two or three scale boards in the box beneath or on top. There is great danger in England of the cheese being attacked by mites, and if the rind is dry and the scale board lies loosely on it, the mites begin to work between the rind and the scale board. The cheese should be well greased just before boxing when the scale-boards will adhere to the surface and prevent the inroads of these damaging insects. Another most objectionable practice is for the cheese-maker to press the scale boards on the cheese while in the hoops. The cheese should be carefully greased before the scale boards are applied. Another thing which I found had a very bad effect on the appearance of the cheese, and therefore on its sale, was that in some shipments there were a great many broken boxes, especially in American cheese, though our Canadian cheese might be improved in that respect. We should insist on our box-makers making better boxes, and better box covers. In fact the covers are far more frequently broken than the boxes. The cover-band surrounding the heading of the box should be at least twice as thick as it generally is. The extra thickness of the hoop would not increase the cost of the box, and the box itself should be very much strengthened. When the box is broken and the surface of the cheese is exposed, it gives the whole lot an unattractive appearance.

Mr. CASSWELL.—I notice that some factories make the bands of the boxes altogether too narrow.

Prof. ROBERTSON.—With regard to boxing cheese in the factory the cheese-maker should mark his brand just where the box laps, and they should be branded neatly and all in the same manner. This adds very much to the appearance of the boxes.

Mr. CASSWELL.—There is another matter with regard to boxing cheese which I think should be mentioned, and that is that the cheese should be shaved off close, because it is very objectionable to have a small space between the box and the cheese.

Prof. ROBERTSON.—I would rather have the box even a little lower than the cheese than have a small projection.

Mr. HUNTER.—We have experienced great difficulty in some places owing to the variation in the size of the boxes.

The PRESIDENT.—It is one of the misfortunes of the business that the attempt to cut down the wages of cheese-makers, or the price of boxes or other things to the lowest figure, results in decreasing the value of our product. I have always told the box-makers to give me the best box they can make, because, even if it does cost a few cents more it adds to the commercial value of the cheese.

Q.—Is it an objection for the cheese to project over?

Prof. ROBERTSON.—Not unless it projects far enough to cause damage in transit.

The PRESIDENT.—I hope Mr. Robertson will not encourage this habit of having the cheese project. The cheese should be the size of the box—that is the safest and best rule.

Prof. Robertson.—With regard to what has been said about the varying size of the boxes, cheese-makers should be more careful to make cheese of a uniform size, and then the box-maker should be required to make the boxes to fit. That does away with the necessity of shaving in most cases, but in any case the box should be shaved to the surface of the cheese. I may say that the cheese shipped to the Colonial Exhibition from all quarters was pretty well boxed, but that from Brockville was unusually satisfactory in that respect; in fact it was the finest I ever saw in England, and I took a pride in putting it where it could be seen.

Q.—Do you like the cheese to go tightly into the box, or how?

Prof. Robertson.—It should be just a nice fit, so that you would not have to jump on it to get it down.

Q.—If the bandage is put on the cheese too large, will it not interfere with the quality, by allowing the cheese to spread on the shelves?

Prof. Robertson.—While I would not encourage the spreading of the cheese I don't think a little of it would do any harm to the body or the quality of the cheese. I have seen it spread three inches on the side, and while it did no injury to the quality, it is an objection to the sale, and especially to the packing of the cheese. With regard to this question of the cheese projecting above the box, I would not have it project to any appreciable extent—not more than a quarter of an inch, as there is a risk of damage to the surface of the cheese, which involves a serious loss to both the exporter and the importer.

MOTIONS OF THANKS.

Mr. Casswell.—As it is getting about time to adjourn I have much pleasure in moving that the thanks of the Association be tendered to Professors L. B. Arnold, I. P. Roberts, J. W. Robertson, and Messrs. W. D. Hoard and M. S. Schell, for their excellent addresses and other valuable information given the members of this Association. I have a great deal of pleasure in moving this resolution for, although on account of the length of the papers and addresses we have not had as much discussion from the floor as we have sometimes had in past conventions, and as I think we should endeavour to have in future conventions, yet we have got from these gentlemen a large amount of valuable, practical information. (Applause). We have been especially delighted with Mr. Hoard's addresses, which contained a great deal of information conveyed in a very pleasant way. I hope we shall have the pleasure of having him again at our conventions. (Applause).

Rev. W. F. Clarke.—I have great pleasure in seconding the resolution and saying a few words in support of it. It will be twenty years on the 31st of next July since this Association was organized. I was present on that occasion, so that I suppose I rank along with the fathers and founders of the institution; and having attended most of the meetings since that time I have had opportunities of watching the progress of this Association pretty closely. Having nothing else to do on this occasion but to look on and listen I have been not only an attentive but a somewhat critical listener; and I can look back through the period this Association has been in existence along the line on which we have been working—the line of better cows, better feeding and care, better milk and better cheese-making. We have been working on those lines nearly twenty years, and it strikes me that we have made more progress along the last line—that is the better making of cheese—than along the others. We have carried that to a pretty high pitch of perfection, but I think we are most of all behind in that point of good cows. I have been looking over the records of the Association, and I notice that very early in its history, though I am an amateur rather than a practical dairyman, I was working along this line of good cows. I kept a few Ayrshires, and was long ago satisfied that the Ayrshire was

the dairy cow; fifteen years ago I said what Mr. Casswell said to-day, that a good dairy cow of the Ayrshire breed might be trusted to yield 5,000 or 6,000 pounds of milk. I showed you fifteen years ago that there were many cows which the farmers had that were simply eating off their own heads, and eating off the heads of a portion of the rest of the herd. Now, you will pardon me if I make one criticism which may, perhaps, sound a little sharp. It strikes me forcibly, and it has struck me so for some time, that this Association is being run too much in the interest of cheese buyers. The bulk of the attendance is made up of cheese-makers, and, although, of course, it is desirable to do everything possible towards improvement in cheese-making, yet I don't think that the Association has got down as much as it should, to the level of the ordinary farmer, who must supply good milk before we can have good cheese, and who must keep good cows in order to have a large supply of good milk. When this question of dairy instructors was being discussed it occurred to me that, not only do the factory men require instruction, but the farmers themselves require it even more than the makers do. I have written and lectured on agriculture for a great many years, and I am perfectly convinced that if you want to inform the farmer on matters pertaining to his industry you must talk the information into him. I don't pretend to be a philosopher on that question, but I know that I have always succeeded better in stirring up the farmers by lectures than by editorial articles. It is true that there is a certain proportion of our farming population who are regular readers of farm and dairy literature, but the great majority must be reached by the tongue rather than the pen. On that point I may say that I think our dairy literature should be a home literature. I begin to think that we are too dependent on foreigners for instruction on these matters, both oral and printed. I am glad to know that both the Dominion Government and the Ontario Government have been doing something for dairy literature. The Dominion Government have got out a work which deserves to rank side by side with Willard and Arnold as a standard work on the dairy. The Dominion Government made a liberal grant to aid in getting out this book which, while it should not be furnished for nothing, should be supplied at so low a price that no farmer could make a reasonable excuse for not buying it. The Ontario Government got out an edition of ten thousand copies, two years ago, which I believe were distributed gratuitously. I notice, however, that those things which are given out gratuitously are not apt to be so much valued as if a price were paid for them. The Dominion Government are getting out an edition of about 100,000, which is to be furnished at the low price of 25 cents a copy. After a critical examination of this book, which has been got up by our friend, Mr. Lynch, I pronounce it a most valuable work, and I should like to see it circulated throughout the whole of our Dominion. I am sorry that the author has not had an opportunity of speaking, but, although he is present, I take the opportunity of giving this spontaneous and unsolicited commendation of the work, and I do so with no desire but to promote the public interest in connection with the dairy. As to the resolution, notwithstanding what I have said about home orators and writers, I do very sincerely and heartily second the vote of thanks to the gentlemen who have contributed addresses and papers to this Convention. (Applause).

The Secretary.—While I have very great pleasure in supporting the resolution which has been moved, I think it would have been well if it had been proposed at an earlier stage of our proceedings, when those interested might have had an opportunity of expressing their feelings towards us personally, and their gratification at meeting us here as fellow-workers in a common cause. I have had some opportunity of learning their feelings with regard to the fraternal intercourse which has taken place on this occasion, and I have heard only one sentiment expressed—a sentiment of gratification at the courteous manner in which they have been treated, and the good-fellowship which has been manifested towards them. As the attendance is so small I will not prolong my remarks, but will simply conclude by endorsing the sentiments of the resolution, and assuring the audience that it will be gratefully received by those to whom it is to be presented. (Applause.)

The PRESIDENT.—I know that it is hardly necessary to put the resolution, because I feel assured that it is the wish of every one present to express in this formal way our thanks for the very able and interesting addresses and papers which have been contributed by the various gentlemen mentioned in the resolution. I regret that at this Convention there has been a smaller attendance of farmers from the immediate neighbourhood than there has ever been at a previous Convention, and I quite agree with Mr. Clarke as to the necessity of carrying the gospel to the heathen, so to speak. The trouble is that the farmers here seem to think that nobody can teach them anything new, or anything that will put another dollar in their pockets. But while we have not had a large attendance of farmers from this neighbourhood, it is gratifying to notice that we have farmers present who have come a long distance at considerable trouble and expense to attend this meeting. Mr. Clarke has referred to the presence of Mr. Lynch, and I am sure we are all sorry that that gentleman has not had an opportunity of addressing the Convention. He has been collecting and arranging a great deal of information, and he is a gentleman to whom I am sure we would all have listened with interest.

The motion was carried, after which the Convention adjourned *sine die*.

II.—DAIRYMEN'S ASSOCIATION OF EASTERN ONTARIO.

DIRECTORS FOR 1887.

President, - - - D. M. Macpherson, Esq., Lancaster.

1st Vice-President, - - D. Vandewater, Esq., Chatterton.

2nd Vice-President, - James Bissell, Esq., Algonquin.

Secretary, - - - - Harford Ashley, Esq., Belleville.

Directors:

Division No. 1.—Wm. Eager, Esq., South Mountain.

Division No. 2.—Edward Kidd, Esq., North Gower.

Division No. 3.—F. H. McCrea, Esq., Brockville.

Division No. 4.—James Haggarty, Esq., W. Huntingdon.

Division No. 5.—Platt Hinman, Esq., Grafton.

Division No. 6.—Henry Wade, Esq., Toronto.

Auditors, - - James Hamilton, Esq., Foxboro'.
N. H. Fields, Esq., Lyn.

LIST OF MEMBERS

OF

THE DAIRYMEN'S ASSOCIATION OF EASTERN ONTARIO,

FOR THE YEAR 1887.

Name.	Post Office.	Name.	Post Office.
Alexander, Jas	Brockville.	Cossitt, Newton	Brockville.
Alexander, W. J.	Brockville.	Cossitt, G. M.	Brockville.
Ashley, H.	Belleville.	Curtis, Allen	Lyndhurst.
Bailey, W. C. (farmer)	Iroquois.	Derbyshire, D.	Brockville.
Birdsell, M.	Felton, Co. of Russell.	Davidson, J. D.	Brockville.
Bird, M.	Stirling.	Davidson, David.	Lyn.
Bissell, Jas.	Algonquin.	Downy, D.	Brockville.
Bissell, Howard.	Algonquin.	Doran, John	Morrisburg.
Bissell, Wm.	Algonquin.	Durham, G. W.	Plum Hollow.
Bissell, Parish.	Algonquin.	Davis, E.	Addison.
Bissell, Chas.	Algonquin.	Daly, P. R.	Foxboro.
Bissell, Braden.	Algonquin.		
Bonisted, W. G.	Belleville.	Eager, Wm.	South Mountain.
Brenton, F. W.	Foxboro.	Edwards, Jno.	Algonquin.
Brown, Case.	Farmersville.	Earls, Rufus.	Algonquin.
Burritt, Albert.	Maitland.	Empey, H. E.	Brockville.
		Everetts, M. K.	Easton's Corners.
Caldwell, Jno., Sr.	Brockville.		
Cheesman, Jas.	Toronto.	Fields, N. H.	Lyn.
Chapin, Lincoln W.	Plum Hollow.	Farrell, Jas.	Maitland.
Cluff, W. J.	Brockville.	Fraser, Hon. C. F.	Brockville.
Comstock, W. H.	Brockville.	Fulford, Geo. T.	Brockville.
Cochrane, Chas.	Battersea.	Ferguson, A. M.	Huntingdon, Que.

List of Members.—*Continued.*

Name.	Post Office.	Name.	Post Office.
Gilpin, Jno.	Brockville.	Miller, Jas.	Spencerville.
Gill, Jno. M.	Brockville.	Mara, M. O.	Lombardy.
Gilroy, C. J.	Glen Buell.	Miller, Thos. J.	Spencerville.
Godkin, Geo. E.	Escott.	Moulton, A.	Farmersville.
Grant, Wm.	Shanley.	Milton, Jno.	Balderson Corners.
		Mallory, A. W.	Mallorytown.
Hanna, Andrew	Farmersville.	McCrea, Geo.	Maitland.
Haggarty, Jas.	W. Huntingdon.	McNish, J. R.	Brockville.
Hayunga, B. H.	Morrisburg.	McCrea, F. H.	Brockville.
Hicock, W. W.	Sweet's Corners.	McNeal, Bruce	Lansdowne.
Hodgson, Jno. M.	Sunbury.	McLean, C. A.	Brockville.
Halliday, E. V.	Elgin.	McDougall, A. D.	rocky
Holmes, Wm.	Shanley.	McVagh, Edwin	Addison.
Horton, T. W	New Dublin.	McLean, G. K.	Lyn.
Howorth, T. G.	Farmersville.	McFarlane, Peter	Huntingdon, Que.
Hughes, M. F.	Napanee.	McTavish, J.	Vancamp.
Hunt, Martin	Lyn.	McDonald, C. C.	Wicklow.
Hinman, Platt	Grafton.	McIntosh, Peter	W. Winchester.
Johns, A. C.	Fairfield, E.		
Judd, J. C.	Brockville.	Nunn, J.	Tilley.
Judson, Miller S.	Lyn.	Nilblock, Stephen	Farmersville.
Judson, Joel	Brockville.	Newall, Jas.	Algonquin.
Jackson, Lincoln	Plum Hollow.		
Johnson, Wm.	Brockville.	Philp, Samuel	Baltimore.
		Pearson, H. S.	Maitland.
Kidd, E.	N. Gower.	Pyne, Alpheus	Newboro.
Kidd, T. A.	Burritt's Rapids.		
Keating, Jas.	Lansdowne.	Robison, Geo.	Easton Corners.
Knapp, Jos.	Plum Hollow.	Robinson, Amos	Brockville.
		Robertson, Jas.	Brockville.
Letroy, J. A.	Escott.	Raphael, J. C.	Smith's Falls.
Manhard, G. A.	Brockville.	Rogers, A.	New Boyne.
Macpherson, D. M.	Lancaster.	Reynolds, E. J.	Brockville.

List of Members.—*Continued.*

Name.	Post Office.	Name.	Post Office.
Stillman, J. H.	Campbellford.	Wright, J. R.	Fournier.
Stowell, C.	Addison.	Wiltse, J. A.	Morton.
Stewart, D.	Glenbecker.	Wing, Chas.	Farmersville.
Soper, H. L.	S. Mountain.	Willoughby, Jno.	Ellisville.
Smith, Chas. W.	Dundela.	Willoughby, W. R.	Gananoque.
Strong, P. W.	Brockville.	Weaver, W. H.	Glen Buell.
Snider, Chas.	Addison.	Wright, Jas.	Algonquin.
Stinson, H. N.	Toledo.	White, Matthew.	Brockville.
Spencer, Addison.	Algonquin.	Wade, Henry.	Toronto.
		Whorry, R.	Iroquois.
Thompson, W. H.	Pittston.	Washburn, L. H.	Soperton.
Thompson, J. E.	Glen Stewart.		
Vandewater, D.	Chatterton.	Young, Geo. S.	Brockville.

TENTH ANNUAL CONVENTION

OF THE

EASTERN DAIRYMEN'S ASSOCIATION.

The Tenth Annual Convention of the Dairymen's Association of Eastern Ontario, assembled in the Court House, at Brockville, on Wednesday, the 5th January, 1887, when the President, D. Derbyshire, Esq., who occupied the chair, opened the proceedings with the following address :

THE PRESIDENT'S ADDRESS.

Ladies and Gentlemen,—It is with feelings of pride that I call to order this our Tenth Annual Convention, in our enterprising town of Brockville, one of the great centres of the dairying interest in Eastern Ontario. We are justly proud of the position we occupy in the dairy world, and the success we achieved at the Indian and Colonial Exhibition, held in the year just drawn to a close, was exceedingly gratifying. Although our first shipment of cheese was never exhibited—owing to the fact that a proper contract, specifying the particular time at which the goods were to be delivered in London, was not made with the steamship company—Messrs. Ballantyne and Macpherson did everything possible to secure suitable space, and a second shipment was sent on in due course. This, on arriving in England, was taken in charge by Professor Robertson, of the dairy department of Guelph Agricultural College, who placed our goods before the notice of the British press and public, with an energy and ability that few probably would have been capable of. I feel proud of his efforts, and am confident we cannot over-estimate the benefits Ontario will derive from the conspicuous manner in which her goods were placed before the world.

Many of those I see here are well aware of the great changes which have taken place within the last few years from grain-raising—the soil being nearly exhausted—to dairying and stock raising. In the latter industries we are now prospering and improving year by year, and our cheese business was never before in such a satisfactory condition.

We are met here in Convention for the purpose of comparing notes, prepared to abandon, as far as possible, the causes of our failures in the past, and to continue with renewed energy the improvement of our stock, by weeding out each year all poor unprofitable animals, and replacing them with better ones, and by better feeding and housing our dairy stock. I think you will all be willing to admit that we have not done as much in this direction as might have been expected, but these are matters that must be carefully attended to if we desire a continuation of our present prosperity. This grand province, the leading one in the Dominion, demands it of you, and if we fail in this we have met in vain.

We need to set our standard high, and to make a rich, solid, silky textured cheese, with a creamy flavour, smooth skin, even size, and weighing about sixty pounds. In order to do this, we must have pure, rich milk, from which no cream has been taken or strippings withheld ; properly aerated, and delivered in nice condition to the factory.

This should be a good building, provided with proper drainage and ventilation, in which the temperature is so under control that it will not be too hot in summer or cold at other seasons, and supplied with the most modern appliances and machinery. This machinery should be in charge of the best maker that can be obtained, one who prides himself on turning out nothing but the finest cheese. The practice of engaging cheap cheese-makers is a common mistake, injurious alike to the reputation of the factory and the cheese-maker, and is instrumental in keeping down prices to the detriment of all interested. We must get rid of our poor factories and bad cheese-makers, if we desire to maintain a high reputation.

I think our factories ought to be divided into sections of, say, ten factories, each of which sections should have a separate instructor. This is a matter which has been spoken of before, and I think it is one which should be placed before the meeting in its strongest light. If we had these instructors one salesman would be able to dispose of all the cheese from the ten factories in a section. The instructors and also a salesman and secretary-treasurer should be paid by the factories. Then I would suggest that there should be two head instructors, paid by the Association, whose duty would be to work a day with each of the section instructors. In this way all the factories would be practically under one management, and the uniformity which is so desirable, would be secured.

This Association has done valuable work in the past, and still continues its efforts in the right direction, but I think the time has come when more good can be effected in the manner I have suggested. Our directors have been live, active men, whose influence on the cheese industry cannot be over-estimated, and I must say that I am proud of our Association, its past work and future possibilities.

I trust you will all enter heartily into the various discussions which will be brought forward by the able gentlemen whom we have with us. I think more can be learned in that than any other way. I extend you all a hearty welcome to Brockville, and trust that the results of your deliberations will tend further to advance the success of our national industry.

In reply to Mr. Wade, the president said that forty more instructors would be required under his proposed plan.

Mr. Macpherson.—When the president last night was proposing to give an address, some of us suggested to him that he should leave a few opportunities of taking exception to his remarks, but I find that he has so closely rivetted together the different parts of his address as to make it almost impossible to find any flaw in it.

In that address he has touched upon some very important points, which I believe are destined to have a beneficial effect on the future prosperity of our Association. His idea of systematizing the cheese manufacturing of this country—the eastern part particularly—is one which, I believe, calls for our most careful consideration, though I must say that in my opinion ten factories under such instructors as proposed by him is too small a number. My own experience leads me to believe that an instructor would have no difficulty in attending to twenty or twenty-five factories very nicely, and would be able to visit that number once a week—which would be quite sufficient—and, perhaps, to make in them once or twice. He would also, I think, have sufficient time to make occasional tests of the milk in the factories under his supervision, all of which would no doubt assist very materially in systematizing our work.

In this respect we might very well take an example from the educational system of this province, which is the closest parallel I can at this moment think of. We have school sections, with teachers in each section, and county inspectors, above them ; as the cheese factory section covers very nearly the same ground as the school section comprises, the analogy is a very close one. The school section requires a teacher, who corresponds with the cheese-maker each factory requires, and the county inspector to the cheese instructor.

Now, why should not each county in the dairy business be systematized in this manner? It would, as I suggested a few years ago, be a great benefit to the patrons

themselves, as well as to the manufacturers. As the system is now carried on, patrons have no means of ascertaining what makers are doing, and, having but little knowledge of the science of cheese-making, the majority of them are not in a position to know whether the cheese-maker is doing his duty or not.

Now, if the patrons contributed a small amount towards the maintenance of this instructor, he would be the representative of their interests as well as of those of the owner, in superintending the manufacture ; he would regulate the condition of the milk, seeing to it that the patrons discharged their obligations, and at the same time conserve their interests by seeing that a good quality of cheese was produced from it.

Then there would be this great advantage to the cheese manufacturer ; he would be receiving an education, and still more important would be the effect this plan would have upon the proportion of cheese of a superior quality, upon which, to a very large extent, depends the value of the article upon the market. The larger the proportion of a poor quality, the lower will be the price even of the good article. Then, again, this systematizing of the factories would secure greater uniformity, the instructors could inspect all cheese, and brand that which was found to be below a certain standard. This, you will see, would be a great saving to buyers, who are now compelled to maintain at heavy expense, agents travelling through the country, who, under this system, might be dispensed with, as the instructor, being responsible for the quality of the cheese turned out from factories under his supervision, would be a guarantee of its quality being up to the standard aimed at. It would be an advantage alike to the patron, the maker, the buyer, the salesman and the consumer. The buyers would be more secure, at less expense in purchasing, and free from vexatious rebates and reclaims put on the factories.

Now, we as patrons and producers of milk are all interested, and should endeavour to secure this system, which will greatly reduce the cost and expense of the business, and result in a division of the benefit among all interested. I think this is a very important question for the dairymen of this country to take into consideration, for you can get no work of any great magnitude accomplished without system.

We have already taken one step in advance in having instructors, who have done much good, though the real benefit cannot be seen. But these instructors have a large territory to cover, and have neither time nor opportunity to return and see what their instructions have resulted in. It may even be at times that their visit has been productive of injury. I have known cases where an instructor came along, and finding something wrong suggested a change, and the maker would go to the opposite extreme and produce injury in that way. It is essential that the instructor shall be able to revisit the factories and see that his instructions are properly acted on, and the proper standard of quality maintained.

I have no doubt that the efforts put forth by this Convention will be far more reaching in their effects than we can conceive, and their results productive of even more good than we imagine. There is no doubt that the Association has been one of the leading means of placing this province in its present high position as the leading dairy country of America.

Mr. Whorry.—I quite agree with Mr. Macpherson that one man could handle more than ten factories. I think that something needs to be done in regard to testing milk ; the only means we have is by watching patrons and we have no satisfactory law in this respect. On the other side they have inspectors of milk who secure samples which are sent to an analyst, and I was told the other day that of twenty-seven samples sent to Ogdensburgh for analysis, twenty-six were found to be watered.

Mr. Alexander.—We are very thankful for the instructors we have already, who do as much as is possible for two men to accomplish under the circumstances. I don't think our President has taken as wide a view as he might of this systematizing process. I think we might have an instructor for every five factories. The question at present, however, is what are we prepared to do ? How much will we allow ? If we are to have an instructor for ten factories I say let us do so ; but I think that our instruction has usually been given too late in the season. Whatever instruction we are prepared to give should be given in the month of May. When we know that a man is making poor

cheese it is too bad to let him go on till the month of August without instruction. Objection has been made to giving instruction in certain localities, because they do not support this Association. That, as far as it goes, is a good objection, but I think if more attention was paid to these medium outside factories we would derive more benefit. They may have no interest in it, and may not desire any instruction, but we have an interest in it, and I think it would be better if the instruction could be given earlier than it has been heretofore.

Mr. Wade.—Have you any reason to believe that these factories will support all these men, and if they will can you secure the instructors?

The President.—Yes; we can get all the teachers we want.

Mr. Whorry.—I say include all the factories that will support them, say twenty, and let the others stand off; in five years' time they will be glad to come in.

Mr. McCrea.—The men who do not support the Association are the very ones we want to reach. If they will not help themselves we must help them, for as long as they continue in ignorance they are injuring us. I am surprised that more do not support this Association and try to improve themselves, but it is by reaching those who will not come to us that the work of the Association is to be done. If they will not come to us we must go to them; that is the light in which we must see it. This matter is one that requires a good deal of agitating, and people must be got to understand that it is their personal interest that this system should be established, then we will have their sympathy and encouragement. We must prove that all who bear a share of the expense are benefitted, and then there will be no difficulty in carrying it on. We may not be prepared to adopt this system at once, but we must be ready this year or next, and should be preparing ourselves by agitating the matter and keeping it before the public.

The President.—I am much gratified at the remarks I have heard, but I am not yet convinced thoroughly that ten factories is not about the right number. I believe ten factories are all a man could look after effectually—that is to be there and test the milk every once in a while and work with the man all day, from the testing of the milk in the morning till the cheese is in the press and in the curing-room, Half our cheese are not properly cared for when they are in the curing-room, and a cheese is only half made when it is placed on the shelves of the curing-room. The point in my mind this morning was to arrive at some standard that would reach every factory, and the plan I proposed I am satisfied is the right one. Suppose these ten factories paid $50 each; it is not much. Why, I have known factories that have lost $300 this year by not having fine quality cheese. If these ten factories paid $50 each towards keeping the instructor, they would have a man perfectly under their own control, who could look after their interests in testing the milk and seeing whether it was wrong or right. I think Mr. Whorry is mistaken in thinking we have no law that covers tampering with milk. I think we can convict a man on the lactometer and fine him for withholding strippings or taking off cream. The lactometer will show that absolutely. If there is one thing more than another which needs looking after, I think it is the inspection of milk. A great deal of poor cheese is made by reason of not having proper curing-rooms; others have a proper curing-room but the making-room is not what it should be. We suffered heavily last year for want of curing accommodation. I believe half the cheese of the late make bought here was not properly cured—that was the cause of the fighting and struggling back and forward between here and Montreal. All these things should be looked into. We must have our factories in better shape if we want to arrive at perfection. If the ten factories would contribute $50 each for these instructors, the general instructor might be paid by the Association.

I believe if cheese-buyers would take a right stand they might do a deal of good. Our buyers are all nice, smooth fellows, and if they go into a factory and find the cheese leaking on the floor or anything wrong they do not say anything—Oh no! they just smile, and shake hands and slip out again, but they don't buy anything. Now, I think that is radically wrong; I believe we should stand up honestly and tell the man square to his face

if he has a bad cheese-maker; then we would get rid of these poor men. A man, to be a cheese-maker needs to have a level head, to be a man of good judgment; and if he has not that he had better study law or some easy thing like that.

Mr. H. Bissell.—I agree with the president that the lactometer is a good test. I am sure that Mr. Macpherson has no difficulty, with his method of testing, to convince his patrons, though it is done privately. I have found several cases of watering milk during the past summer, which I have reported to the proprietors, and when they went to the patrons the latter have owned up. The idea of an instructor for every ten factories is a grand one. I do not agree with Mr. Alexander in thinking the instruction is not given early enough. I have been to several factories in the Brockville district where in May they were making a fancy cheese, and in August it seemed to go all to the dogs. I was in Montreal in July, and was told in Mr. Ayer's office of a factory that was making a fancy cheese, but in September I found that the same factory was making a very inferior article. That is the way I find it. We do not want to make the same quality in May that we make in July, or in July the same as we would make in October; there is a difference in the seasons, and a man has to understand his business. I think it is a great mistake of cheese-makers not to take more interest in these meetings; my experience is that the best cheese-makers we have are the men who take an active part in the conventions, while the poor ones all stay at home. When the instructors first began going through the country they had almost to beg their way through the factories, but now they are glad to see you and take advice. Another thing I have noticed is that it is almost impossible to get good cheese in any of our towns; if there is a poor cheese made it is sure to be consumed in our own country. This is a great mistake; we can afford to eat good cheese here just as well as they can in England.

Mr. Macpherson.—While this question is up I would just like to say that the best factories in this country are losing money that they do not know anything about. Every poor cheese that is made is taking away value from the product of the good factories. If all our cheese were up to the standard of the best factories we would receive from a quarter to half a cent per pound more for the whole. It does not require very much figuring to demonstrate that a quarter of a cent per pound on the output of our good factories would mean $250 or $350 more profit to them in a year. Now, an outlay of $50 a year would do that and more, because our cheese, on account of its improved quality, would be coming more and more in demand, and would consequently increase in value. It is almost impossible to estimate the benefits that would be derived by factories in this way. I notice that there is a feeling that it would be unfair for the men who keep good makers and make good cheese to be called upon to pay a share of the expense of instructing poor manufacturers. Now, I hold that our best factories are losing twenty times the amount of the outlay these instructors would entail. I believe a gentleman is going to prove to us in this convention that as compared with the western men we are losing thousands of dollars every year by reason of this inferior quality cheese. There is no doubt there is some truth in that, and what is the cause of it? I find that Ingersoll cheese is worth from a-half to three-quarters of a cent more in the London market than any other from this country. Why is it? It is just simply because of the reputation they have gained, and if we systematize our manufacture, and bring our cheese up to a uniformly high standard we will realize that extra half or three-quarters of a cent per pound.

Mr. Daly.—I have been very much pleased with this discussion and the manner in which it has been handled, and have drawn much new light from the views expressed. It has been proposed that each of the factories should contribute $50 annually towards having these instructors. Now, the question is how shall we induce them to do so, how shall we place the matter before them? I would suggest that the Association, before the close of the present Convention, should offer a premium which would make it worth while for some gentleman to get up a paper on the subject, and that a committee should be appointed with power to have the best paper submitted to them printed, and copies sent to each factory in eastern Ontario. I think that would be a good way to place it before them.

Mr. MILLER.—I agree with Mr. Alexander in thinking that the instruction should be given earlier in the year, before the end of June anyway.

Mr. ASHLEY.—I do not think it would require as much as $50 from each factory. An instructor over ten or twenty factories would not be as costly as our general instructors. It strikes me that if each owner or president of a cheese factory would call a meeting of his patrons, and place this matter properly before them, submitting to them the facts we have had here this morning—that is, that to an ordinary factory turning out 80,000 pounds of cheese a quarter of a cent advance per pound would mean $200 extra profit—they would be willing to contribute to the expense. I am satisfied if the matter were properly placed before my patrons that nine-tenths of them would be willing to contribute $20 out of the factory to make the experiment, and if a benefit were derived from it there would be no difficulty in continuing it.

Mr. ALEXANDER.—It would be almost impossible to get the patrons in this section to contribute. They will not even spend a couple of days in coming here and learning something, and if we cannot get them out for that we cannot get them to pay anything for an instructor. The fact is they don't want an instructor; they would rather hire a cheese-maker for about $10 a month.

Mr. JAMES BISSELL.—I think differently. I have had a great many years' experience in the business, and I think the patrons would contribute towards the instruction if the manufacturers would set them the example. I quite agree with the remarks of Mr. Daly, and think the matter should be placed before the people by a circular or something like that. There is another matter I have thought of; if the buyers would take more interest in the quality of goods manufactured in our factories we would have a better sample of cheese. I know that buyers sometimes come to our factory, and I ask them "Did you buy anything at such and such a factory?" and they will say "No, I don't want their cheese; I did not say anything, but I did not buy any cheese." As long as buyers continue to do that, these people are not aware that they are not making the quality of cheese that is wanted. If the buyers would quietly show them the imperfections in their cheese it would be almost as good as having the instructor.

Mr. WADE.—I think the trouble lies with the "nice smooth fellows," the buyers that the President speaks of. If they did not touch the poor article there would be no trouble. I think they buy up all this poor cheese on the sly, and ship it off to Toronto.

Mr. VANDEWATER.—A great many factories are manufacturing by the pound. A patron sends along 500 pounds of milk that he knows is not quite right, and it will be taken in; they cannot afford to lose the profit on that milk. I am afraid there is too much of that going on.

The PRESIDENT.—I am very much pleased with the discussion which has taken place, and am more clearly than ever convinced that the plan can be carried out. I hope the discussion will be followed up and brought before our Board of Trade, and that they will see the necessity of paying more money towards instructors. The Association, having only a limited amount of money at its disposal, cannot hire instructors unless aided by the people, but I think if we can get every factory to give ten or fifteen dollars in this way it can be managed.

Mr. ASHLEY.—By the plan I propose it would only amount to six or eight cents for each cow; that is, a man sending ten cows milk would pay about eighty cents. Now if I explained to him that this experiment was only going to cost him seventy-five or eighty cents I think he would try it for once at any rate.

COMMITTEES.

The following Committees were then appointed :—

On Nominations.—Messrs. D. Vandewater, James Bissell and D. M. Macpherson.

Order of Business.—Messrs. D. M. Macpherson, James Haggarty and Joseph Miller.

On Finance.—Messrs. Ira Morgan, Henry Wade and James Haggarty.

On Dairy Utensils.—Messrs. H. Bissell, James Whitten, Robert Whorry and M. Bird.

On Dairy and Improved Stock.—Messrs. F. H. McCrea, Robert Walker and Joseph Haggarty.

At half-past twelve o'clock the meeting was adjourned till 1.30 p.m.

After recess Mr. H. Ashley, Secretary of the Association, by request of Hon. Harris Lewis, of New York, read that gentleman's paper on

BUTTER-MAKING.

Butter that looks neat and tastes good is pleasing to everybody, and will always bring the highest price in any market. In fact, this kind of butter will sell itself for a fair price, however much inferior butter or imitation stuff may come in competition with it. If every dairyman and dairymaid will make the kind of butter above described, the business in counterfeit butter will come to an end, and that right early. But we have another kind of butter which costs the producers the same amount of money and labour to produce, which looks repulsive and smells bad ; and by putting the looks and smell together, we get the taste (in our imagination) very nearly. Is it any wonder, then, that the last described butter, when placed in competition in the markets with clean looking oleomargarine, butterine, pigine, dogine or ratine, should sell for a less price ? All the bogus butter-makers fully understand the importance of putting their butter up in neat, fancy packages and giving it an inviting appearance. Imitation butter is now made with almost all kinds of vegetable and animal oils, and is so close a counterfeit of natural butter that 60,000,000 pounds were sold last season in place of butter. Are the butter-makers willing to admit that the grease taken from horses and mules dying in the streets of our cities, and the grease extracted from hogs dying of hog cholera, at the west, can be made into imitation butter that will outsell that made from the gentle cow ?

In butter-making the most important factor to ensure success is the butter-maker ; for the simple reason that butter-making is an art and not a science, and is to remain an art so long as our climate is subject to the great and sudden changes of temperature which now prevail. Hence, butter-making cannot be reduced to scientific rules and practices ; but success in the business must depend on the mother wit, or gumption of the maker. Again, the butter-maker must love the business, so that all the little matters pertaining to it will be attended to at the right time and in the proper manner.

The second essential to success in making butter is a good, reliable thermometer. No person, however skillful, can tell the temperature of the milk, cream or butter by the sense of feeling ; hence a thermometer is indispensable. I would no sooner try to make butter without a thermometer than to cross the ocean without a chart and compass, or to make first-class butter without a cow. Those who think they can regulate the temperature of the cream by the sense of feeling, will be convinced of their error by trying the following simple experiment :—Take two dishes of water, one hot and the other cold, immerse one hand in the hot water and the other in the cold, for a few minutes, then turn both dishes into one and immerse both hands in the mixed water, and to one hand it will seem hot and to the other hand cold.

The third essential in making butter is the building in which the milk is set for creaming, and the butter made and kept until sent to market. The building should be devoted to the single purpose of butter-making, and so constructed that a uniform temperature can be maintained throughout the year at a small cost of labour and money.

A very large quantity of good butter is ruined before it reaches the table of the consumer, by the ups and downs of the temperature alone. Very much more is ruined by improper transportation and storage, so that all the sin for poor butter does not lie at the butter-maker's door.

The breed of the cow from which the butter is produced, has considerable to do with the quality of the product and the amount of labour required to produce it. But the breed of the cow is not as essential as either of the before named matters; for good butter is produced from all the known breeds of cows, and also from the universal scrub, but not without the proper temperature and other essentials directed by skillful hands. The Normandy cow, her descendants and grades are, without doubt, the best cows for butter we have. However low they have been graded, they maintain the large butter globule in their milk, which rises quick and clean from the milk and churns with less labour than the cream of any other breed we have.

The highest types of the Normandy cow are the Guernsey and Jersey, and the lowest, the Quebec grade, or the more inferior-looking Canada cow; the remote descendant of the Normandy cow, taken to Canada by the French in their early settlement of the country. The butter from this breed of cows, more familiarly known as Jersey butter, has a brighter colour, more distinct grain, and will endure a higher temperature without melting than almost any other kind, but has not as good long-keeping qualities.

Having selected a butter herd best suited to your wants, provide it, at all times, with an abundant supply of good food, pure water and salt, easy of access. The care of the herd is also essential to success in butter-making, as all unkind treatment of the cow will first tell on the quality of the milk, cream and butter, and second, on the quantity. The milking should be done with clock-like regularity and with absolute cleanliness, as no taints or odours foreign to the milk will improve the quality of the butter. As soon as possible, after the milk is drawn from the cows, it should be set for creaming and remain at rest until the cream is separated from the milk, unless the centrifugal method of separating the cream is adopted.

We now have a great many devices for obtaining the cream, giving to the butter-maker a wide range to choose from; but when all the advantages and disadvantages are carefully summed up, pertaining to each system or method for separating the cream from the milk, but little choice is left, and that choice may well be made from the conveniences at hand and the purposes for which the skim milk is desired.

After a trial of all the methods now in use for separating the cream from the milk, except the centrifugal, I have adopted the large shallow pan, keeping the milk at the temperature of 60 degrees Fah., and believe that by this method of creaming the milk the best butter and the longest-keeping butter can be made. Milk kept at the temperature of 60 degrees, and not over four inches deep, will throw up all the cream worth having before the milk will sour, except during a few days of our worst butter-making weather.

No fixed time can be given for removing the cream from the milk, except when the cream is all up, and as this time depends more upon the condtion of the atmosphere than the tick of the clock, it must be left with the butter-maker When the wind is from the north, north-west or west, the cream will rise much sooner and clearer from the milk and the milk remain much longer before souring, than when the wind is from the opposite direction. The cream should always be removed whenever any degree of acidity is found in it or in the milk. No cream will rise through milk after it becomes sour, but the acid of the milk will consume more or less of the butter in the cream coming in contact with it.

Again, cream is sometimes left on the milk until it becomes bitter; and no amount of skill or care can produce good, sweet butter from bitter cream.

The dish for holding the cream, from one churning to the next, should be made of tin, and large enough to hold a churning of cream without filling it so full as to endanger pill ing the cream when turning it into the churn, or slopping it over when stirring it.

For a small dairy, an ordinary tin pail will answer every purpose for the cream, but for a large dairy a can constructed like an ordinary carrying can, with a lip on one side, will be found very convenient. Now, if the cream is ready to be removed from the milk, and has risen firm and thick, remove with it half as much milk as you have of the cream, and put into the cream can with it four ounces of salt to each gallon of cream, or a large tablespoonful to each quart of cream. Stir the salt and cream gently but thoroughly together, and each time cream is added stir until all is mixed, and continue this method with each skimming until enough is gathered for a churning. By adding the small quantity of salt as above directed, the acidity of the oldest cream in the churning is held in check until the last added has time to ripen without an excessive amount of acidity, and is so important in the production of first-class butter that it never ought to be omitted.

Without doubt the best butter can be produced by churning every day, (Sundays excepted.)

When the cream is taken from the milk in its first perceptible acid and kept at the temperature of 60 degrees, it will be in good condition, as a general rule, to churn the next day. No cream will yield all its butter to the churn until it has passed certain chemical changes which, for the want of a better term, we will call the ripening process. Now, if we churn a batch of cream, a part of which has ripened and a part just taken from the milk, the butter in the unripened cream will remain in the butter-milk and be lost unless the buttermilk is churned again. It is, therefore, better to give the cream time to ripen, and keep it so thoroughly stirred together that all will ripen at the same time and yield its butter at once. When the cream is in just the right condition to churn, is the most difficult problem to solve in butter-making, and requires a great deal of careful study and practice.

The cream, when ripened and ready to churn, has a clear, glossy look, a smooth, unctuous feel, and a moderate acid taste. The vast amount of butter remaining in the buttermilk, and therefore lost, is my excuse for dwelling so long on the subject "When to Churn."

The old dasher churn will produce as good butter as any churn we have because it brings the butter by concussion of the cream, and not by friction; but the dasher churn is not so easy to operate as some other kinds, or so convenient to use.

The revolving box churn and the revolving barrel churn both bring the butter by concussion of the cream without breaking the grain of the butter, and are convenient to use, and in some particulars the revolving barrel churn is preferable to any churn we now have.

All the implements used in butter-making with which the butter comes in contact, should be made of some firm, close-grained wood, and all, before being used, subjected to contact with boiling water for a few minutes and then cooled down to about 60 degrees with cold water.

If the churn is ready for the cream and the cream ripe to churn, ascertain the temperature with a thermometer, after thoroughly stirring it; and if below 60 degrees set the cream can in a tub or vessel of hot water and continue stirring the cream until it reaches 60 degrees; but if the cream is too warm, place the can in a vessel of cold water and continue stirring until the cream is reduced to 60 degrees.

It is bad policy to temper the cream by the addition of water, either hot or cold. Now, if the food you supply the cow will enable her to give to the butter that peculiar, bright, golden colour so much desired, the cream is ready to churn. But if the cow is unable, with her food, to give to the butter the desired colour, you can now aid her by adding to the cream a sufficient amount of pure annatto colouring, prepared in liquid form by chemists who understand their business.

The churn should be run just so fast and no faster than to give to the cream its greatest concussion as it drops from side to side, or end to end, of the churn.

In ordinary revolving box or barrel churns from thirty to forty revolutions per minute will be found about the right speed to run them. When the butter comes in granules about the size of wheat kernels, or a little larger, the churning is completed and the buttermilk ready to draw off from the butter. The buttermilk remaining in the

butter can now be rinsed out with two or three washings of pure water at the temperature of fifty-five degrees or a little colder, and the butter removed from the last rinsing water with a wooden skimmer suitable to the butter-worker, which should be inclined sufficiently to allow the water taken out of the churn with the butter to drain off.

After ascertaining the weight of butter and making due allowance for the water remaining in it, weigh the salt, so that from three-quarters of an ounce to one ounce will remain per pound of butter when finished. Spread the butter out on the worker and apply the salt through a fine meshed wire sieve. Stir the salt evenly into the butter with a suitable paddle prepared for the purpose. The butter is now freed from buttermilk, and the salt evenly incorporated with it without injury to the grain of the butter, and ready for its final working and packing.

In working the butter a downward pressure and rolling motion is all that is necessary to expel the surplus brine and give to the butter sufficient solidity for packing.

The Welsh butter tub appears to suit the butter traders as well as any package now in use. These tubs are generally made of white ash, spruce or white oak, and are about twelve inches high, twelve inches bottom diameter, and fourteen inches top diameter, holding fifty pounds if well filled.

When a wooden package is used for butter, the woody flavour may be removed by first soaking the package in hot brine, as follows:—Put a quart of salt into the tub and fill the tub full of water, boiling hot. When this brine becomes cold it should be thrown away and a like quantity of salt put into the tub and filled with clean water which may remain in the tub until it is wanted for use. When wanted, empty the brine, drain, weigh, and plainly mark the honest weight of the tub on the side and cover. Now, if the butter is properly worked, as above directed, here is the tub in its best possible condition to receive it, and no time should be lost in packing the butter firmly and excluding it from the action of the atmosphere.

When the tub is filled, place over the butter a circular cover of paraffine paper, neatly tucked down between the butter and tub. The paraffine paper is a non-conductor, yet semi-transparent, and if neatly put on will exclude the air and at the same time show the butter as though nothing was on, giving it a neat, inviting appearance.

When there is a good demand for butter put up in fancy styles, ready for table use, five cents per pound extra should be paid the producer for extra care and labour; and unless butter in small packages goes into immediate consumption, disappointment often follows. In conclusion, I would advise butter-makers to sell their butter when new, and let it go into consumption when nice, new and sweet.

A Member.—I did not quite catch the idea when the salt was to be put into the cream.

Mr. Lewis.—If it is the first skimming only; when you take off the first cream put in about a tablespoonful of salt to the quart, and churn it thoroughly. This takes away the acid, and as you add another batch of cream stir again, but do not put in any more salt.

Mr. Ashley.—When you have sufficient for a churning you do not require to do that?

Mr. Lewis.—No; where a single skimming is sufficient you do not need to add any salt at all.

Mr. Lynch.—There is one thing in Mr. Lewis' paper to which I take exception; that is that butter-making is an art, not a science. I think no stronger argument is needed against that statement than Mr. Lewis' own paper. He has shown us that it is a science and not a rule of thumb process in the most striking manner possible, by the advocacy of the use of the thermometer and telling us how to provide against undue acid; and also by his description of the granular process, which is enough in itself to establish that it is a science. There are people who have gone on a farm knowing very little about butter-

making, and who were obliged to learn by rule—you have read of them in the States—who have taken prizes for butter-making, succeeding far beyond those who worked by rule of thumb. While I fully agree with and endorse all Mr. Lewis has said, I still protest against assuming or claiming that butter-making is merely an art, and not a science.

Mr. Lewis.—With all due respect for Mr. Lynch I may say that it seems to me impossible to bring everything down to a scientific principle in a climate subject to such sudden changes as ours, either in butter or cheese-making. It seems to me it is an art and not a science, but still, to accommodate Mr. Lynch, I am willing to forego contending with him on the matter.

A Member.—Mr. Lynch does not tell us that when the cream is ready to be churned there is no room for an exercise of judgment?

Mr. Lynch.—I mean to say that making it a science will help you a great deal; it is the difference between the rule of reason and the rule of thumb—that is the point I wanted to make.

Mr. Lewis.—That very point has cost me more labour and trouble and study, and perplexed me more than anything else about butter-making—to know when to churn the cream. I know that thousands upon thousands of pounds of butter are thrown away simply through not churning at the proper time. I cannot describe it to you any clearer than to say that the cream should have a shining look and a smooth unctuous feeling, and should be a little bit acid; that most of you can tell, but the other two points are difficult, and require long and careful practice.

A Member.—How much salt do you consider necessary to the pound of butter?

Mr. Lewis.—The trade, I think, now requires about three-quarters of an ounce of salt to the pound of butter; that is about the average. We country greenhorns, away back from the sea, require about an ounce to the pound, but on the sea coast, where the salt water is not many miles off, and you get your dews and fogs and everything else all salted, you will not want so much salt in your butter. If I were making butter for the sea coast market I would not put in more than half an ounce to the pound. I know you will be ready to bear me out in saying that we require less and less salt in our butter. We used to want an ounce in the pound, but now there are few who require so much. The time may come when Mr. Lynch and I can salt our butter right in the churn, in the brine, take saturated brine and salt our butter with that; then we will want just enough brine on it to pack it, and it will be salted exactly right.

Mr. Ashley.—You might tell us about how much butter is lost by not knowing when to churn the cream. What difference does it make in churning when it is just right, and as it is done by the ordinary butter-maker?

Mr. Lewis.—I think, taking one butter-maker with another, one-fifth is lost; that is quite an item.

The President.—If you put four and a-half ounces of salt to the pound you would not lose very much, would you? (Laughter). We have makers here in the Brockville section—the very poorest, and those who give the least care and attention—who put about that quantity of coarse salt to the pound of butter, and bring it into the market. That is something this discussion ought to remedy. A great many of them, I think, put this salt in for the purpose of selling it at twenty cents a pound. We ought to set our faces against this high salting. There is another trouble we have with our country merchants; they are influenced by the amount of trading a man does with them. If a man trades two or three hundred dollars a year with them they don't like to tell his wife that she is not the finest butter-maker in the world, though the salt does stick right out on top of the tub. Now, we have merchants who can do that, and take that butter at full prices, and they are what I call patriots when they can stand up and do that. But the buyers here will only pay ten or twelve cents for that kind of stuff while they give twenty for good, and I think we can teach some of these people a salutary lesson.

Mr. Lewis.—I believe coarse salt to be altogether unsuited for butter; the salt should be a very fine grain, and uniformly fine. Then the practice of rubbing salt around the inside of the tub when it is wet, before putting the butter in—

The President.—Yes, and three-quarters of an inch in the bottom of the tub.

Mr. Lewis.—Yes, that is ridiculous. Don't you know that a dealer, when he has your butter in a tub, can set it bottom upwards and take the tub off and see what you have under it. I think I would be so ashamed to have my butter go to market in that condition that I would not go with it and look on. When your tub is thoroughly soaked, when it has all the brine that it will hold, empty it out and drain, and then wet; it is then in the best possible condition to pack your butter. I salt the tub with brine.

Mr. Everards.—Country customers don't hesitate in thinking they can take in this inferior butter at from twelve to fifteen cents and then sell it to Mr. Derbyshire at sixteen or eighteen cents—this salt butter.

A Member.—I want to know if that butter is second cousin to oleomargarine or not?

The President.—Oleomargarine is a blessing in disguise when compared with some of the miserable stuff that I, as well as others, have seen. It is only a few years since western Ontario butter was bought and sold at from eight to eleven cents per pound, but they are now turning their attention in the west to creamery business, and some of the butter sent from the western section to the Colonial Exhibition could not be beaten for fine quality. That shows that the inferiority was not on account of the climate or any of those excuses; for the moment they adopt scientific processes in the management of their cream and milk—or art, as our friend Lewis will have it—fancy butter can be sent from any part of Canada. I am satisfied that as regards butter we must turn our attention to creameries. I would like to see, in sections where there are no factories, creameries established, where a little butter would be made that would establish our reputation in the old country, and let them know that we can make as fine butter as any country in the world. There is no reason why, with equal skill and as good machinery, we should not make just as fine butter as any other section, instead of it being as it is at present a drug on the English market.

Mr. Macpherson.—We have with us a gentleman of large experience in butter-making, Mr. Harris, of Iowa, son of Prof. J. B. Harris, of Antwerp, New York. It would be of interest to hear a relation of his experience.

Mr. Harris.—I am altogether unaccustomed to speaking before conventions, but shall be happy to answer any questions you may ask me.

The President.—Do the farmers in your section draw their own cream?

Mr. Harris.—The farmers deliver the milk to us, and we raise our own cream. We have six hundred gallon vats, similar, I believe, to those you use here. We make butter about eight months of the year and cheese the rest.

A Member.—What do you do with the balance of the skim milk?

Mr. Harris.—We make it into skim cheese, which sell in October and November at eleven cents a pound. The cheese is mostly consumed in the south and the northwest. The milk is delivered to us at the factory once a day, and we weigh it, crediting each patron with the amount delivered. It is run directly into these vats, where it sets as long as we can allow without any change, or any acid developing. At this time of the year it sets twenty-four hours. We always calculate to skim it before any change comes on the milk. Our experience is about our only guide, though we can tell something, too, by the temperature of the milk as it comes in in the morning. If the milk is down to sixty-two in the morning we reckon it will keep till about twelve o'clock at night; that is about eighteen hours. During colder weather, in the winter time, if the milk comes in at sixty or sixty-two it will hold twenty-four hours. As I said before we have two hundred gallon cream vats—two of them—and we can run water through them and have a steam pipe attached to heat water, and can keep the cream at any temperature we please. A great deal depends upon the weather. If it is real warm weather we get the cream down to about fifty-six and hold it there, and by holding it at fifty-six we find it is

just about the right degree of sourness to churn the next morning. I have churned cream very often at fifty-eight in warm weather, and it is quite necessary to churn it at as low a temperature as that to get it in the granulated form. We use a square box churn, with nothing on the inside of it, and salt in the granulated form in a similar manner to that described by Mr. Lewis. Generally salt is stirred in, and the butter worked a little; we only work it once. Our place is in reality a cheese factory in warm weather; the balance of the year we make butter and cheese every day.

A Member.—Do you make any difference in the milk for the purpose of making butter?

Mr. Harris.—In the fall we do. When we first commence to make butter in the fall we instruct our patrons to cool their night's milk and their morning's milk, and we take care to see that it is delivered at about sixty or sixty-two, which is about as cool as we can get them to deliver it.

A Member.—How do you raise cream?

Mr. Harris.—When we want more cream than it will raise we heat the milk up by steam to about sixty-eight and then let it gradually cool down. We calculate we can raise more cream at between fifty and sixty than any other temperature.

Mr. Lewis.—How much salt do you add in the solid form?

Mr. Harris.—About three-quarters of an ounce to the pound.

Mr. Lynch.—Some of that is worked out in brine?

Mr. Harris.—Yes. Of course sometimes, in the fall and spring of the year, it is necessary to use an ounce.

Mr. Lynch.—Can you tell how much is in the butter when you have done salting?

Mr. Harris.—I could not tell exactly. I should judge three-quarters of an ounce when we use the ounce.

A Member.—Do you use ice for getting cream out?

Mr. Harris.—No, the only thing we use ice for is tempering our cream after it is skimmed.

Mr. Macpherson.—Do you find the tendency in the direction of making more butter or more cheese?

Mr. Harris.—The last two years it has been to make more butter and less cheese.

Mr. Lewis.—Did you ever try the system of gathering cream?

Mr. Harris.—Yes, in Iowa, for a year:—I may say that I am not at present in Iowa, but Nebraska. I do not know whether it was the fault of the patrons or that the system of dairying was new, but it did not succeed very well. I am satisfied that you cannot make as good butter on the gathered system as where you have raised your own cream.

Mr. Lewis.—Before this subject is dismissed I wish an opportunity of advising Canadian butter-makers who want to get rich in the business to get up their dairy buildings in first class condition, and go in for making winter butter. If they bring in their herds about October, and feed them carefully through the winter, they will have all the winter temperature in favour of their butter, when it is new, and has flavour and aroma. They will be able to sell their butter at the highest prices, they can live through the winter for less money, and can attend to the matter themselves without such hindrances and interruptions as haying, harvesting and the cultivation of crops. If your herds are well kept they will yield almost as many pounds of butter per day as in summer, and you will get five cents per pound more for it. The market is overloaded with butter in May, June and July; but none that is new, and nice, and sweet is offered in the winter. I hope some of you will try this.

REPORT OF INSTRUCTOR JAMES WHITTON.

I submit to you with pleasure my fourth Annual Report as Cheese Instructor for the district lying between Kingston and Toronto. I commenced giving instruction on May the 13th, at the Eclipse Factory, and finished at Edinburgh on August 16th, having made cheese and given instruction in 105 factories as follows :—

[Here followed a list of the factories visited and the date of each visit.]

I am glad to be able to report that the quality of our cheese is greatly improved, it being now almost an exception to find a cheese-maker who is not doing his best to turn out a fine quality of cheese, and, where patrons send clean, sweet, unadulterated milk, they are in most cases successful. I wish to say to the Association that more attention must be given to the necessity of having pure milk sent to the factories if we desire to retain the laurels for making fine goods. Where I made milk tests, I found not a few instances in which one-half of the patrons tampered with the milk, either by adding water or taking a portion of the cream. It affords me pleasure to be able to inform you that bad rennet is one of the things of the past.

Mr. Macpherson.—I would like to ask Mr. Whitton whether the improvement which he says he has found during the last year, is attributable to the improved system of making under instruction, or to the quality of the milk, or both combined.

Mr. Whitton.—Well, the cheese-makers are more diligent and attentive to business, and they do not drive so many fast horses ; they find it doesn't pay. When they found that they could not get the prices for their goods they were glad to send for the instructor, or some other person who knew, to tell them where the deficiency was, and what was the remedy. As I said in my report, there is more harm done by patrons not sending milk in proper condition than by the makers making poor cheese. As a rule the makers are getting pretty apt, and are willing to do justice if the patrons will only give them a chance.

Mr. Alexander.—I understood you to say that you visited 105 factories. Can you tell us how many of these were making fine, how many good, and so on ?

Mr. Whitton.—Well, take the Belleville section, one-half of it will pass as fancy cheese, a-quarter is fair, and the balance very poor. That would be one-quarter poor. In other sections the standard is not quite so high; down in the Kingston section, the cheese is not as good, though Mr. Hodgson, who comes from there, makes a good cheese.

Mr. A. Duprau.—I would like to know which makes the finest cheese, fine or coarse cut curd—the solidest cheese ?

Mr. Whitton.—I go in for coarse-cut curd, the fine-curd system makes cheese too dry, not solid enough.

Mr. H. Bissell.—I cut according to the condition of the milk. If I have a batch of milk to work fast I cut that fine, if slow I cut coarse.

Mr. Whorry.—I would like to hear a little more from Mr. Whitton about the adulterated milk.

Mr. Whitton.—Some of them sent nothing but skim milk.

Mr. Whorry.—I think this is a very important thing to bring before the people. I would like to know whether there were any legal means at Mr. Whitton's disposal to stop this, and if so, why he did not make use of them.

Mr. Whitton.—I think this is an argument in favour of the plan proposed this forenoon of having more instructors. We want instructors who are thorough judges of milk, as well as good cheese-makers, and they should be equipped with proper utensils for testing milk. If the instructor finds that patrons of a factory are adulterating, let

him make a thorough test, return next morning to make another, and repeat that till he gets the factory running right. In one factory I found seventy-five per cent. of the patrons were sending skimmed milk, and I turned the thing over so that there was only twenty-five per cent.; they knew I was going to be there the next morning, and so we got good milk. Seventy-five per cent. of the whole were either sending watered or skimmed milk.

Mr. WHORRY.—I think it is no more than fair and right that people should understand this. My experience in testing milk is, that there is a very much larger proportion of patrons adulterating milk, either by watering or taking off part of the cream, than is generally supposed, especially in Glengarry.

Mr. H. BISSELL.—I quite agree with Mr. Whorry. I have found men that I supposed were honourable, watering milk, men in whom I would have put all the confidence in the world. I have gone and told these men, and some of them have owned up, others tried to get out of it by blaming the hired man, or the girl, or the children, who they said put it in. One man said the cow tipped a pail of water in the milk. I quite agree with Mr. Whitton that all the poor cheese is not to be blamed on the cheese-maker.

Mr. MCDOUGALL.—I have always supposed that everybody was honest, except rank politicians on the other side, and it is quite a surprise for me to learn this afternoon that farmers are the worst people in the province. I think something should be done in connection with the cheese business, if the statement of these instructors is correct, as I suppose it is—that seventy-five per cent. adulterate their milk.

The PRESIDENT.—We have a conscience in this part of the district, and there are not so many who water their milk. You know there was a man at Morristown caught watering his milk this summer, and he just walked down to the St. Lawrence and drowned himself—drowned himself in the same water he had been putting into his milk. He did not want to live in this community any longer.

Mr. WHORRY.—I think a stop should be put to this adulteration by some means. In 1874, I tested the milk of two thousand patrons four successive times, and I got no less than 325 who owned up to tampering with it. This was only once; there were lots of small ones that I had to let slip by. In 1885, making the same test I only got 125, so we had got down by being a bit strict with them. This was in Stormont, Dundas and Glengarry. I think we are now taking hold of this matter right. As I said this morning, I think our laws are not strict enough, and we want to try and get the Government to give legislation like what they have on the American side.

Mr. LEWIS.—You surprise me by the superiority of your people over ours. I have told folks on our side that we watered our milk more than the Canadians; that we were more inclined to dishonesty; but after this afternoon I guess I will have to take that back. I think for roguery you Canadians will beat the world.

Mr. ALEXANDER.—I am glad the adulteration is confined principally to watering, so long as the cream is not taken off.

Mr. WHORRY.—I would like to set you right about that. I think I would be safe in saying that of all the milk I have tested in four years, one-half of that which had been tampered with had more or less cream taken off.

Mr. MCCREA.—Do I understand that this evil exists in all the factories?

Mr. WHITTON.—No, I don't wish that to be understood; I think we have fifty per cent. that send honest milk altogether.

Mr. MCCREA.—We have many patrons who think it is no harm to take half a pint or so of cream from a large quantity of milk, but when you have fifty patrons doing the same thing, it makes a deal of difference. I think a great deal of the tampering is done in that way.

Mr. ALEXANDER.—I would like to ask Mr. Macpherson for some figures in relation to this matter.

Mr. Macpherson.—A quart of ordinary liquid cream will make about a pound of cheese; that is, the cream you would take off a can. It would make a good pound, perhaps a fraction more. Well, if forty or fifty patrons take a pint off their cans, it would make twenty-five quarts, which would represent twenty-five pounds of cheese. That is to say, it would reduce the yield of cheese twenty-five pounds per day, provided they all did it. Of course it makes a serious reduction in the aggregate; more than we imagine this little tampering, which is occasionally indulged in, would make. I might say, that in my own experience we ocasionally meet with a patron who tampers with the milk, but we deal with him very severely and promptly. The milk is inspected once a fortnight, and on the first occasion of any variation from the standard of quality by that dairy we immediately notify the owner, and charge him damages sufficient to cover it. If it is only a very trivial appearance of tampering, we notify him, and warn him to be more careful, that if it occurs again we will be more severe. That is our system, and we have very little trouble.

For inspection, we use the lactometer, the cream gauge and the thermometer. We first measure the specific gravity by the lactometer, then we set the milk in small vessels with cream gauges in cold water, ice water, for six or eight hours, and we measure the amount of cream in this way. We keep a record of the temperature of the milk, the specific gravity, and the amount of cream. We have a book specially devoted to that purpose, to keep an accurate record of the milk as taken into the different factories. I may say that we preserve this for future reference, so that in this way we get an idea of the standard of every patron's milk. We do not have a common standard, but we take every man's dairy by his own. If we find there is any apprehension of tampering with the milk, the inspector goes to the dairy and sees the cows milked, and takes the milk to the factory, where it undergoes the same treatment the other has done, and in this way we have no difficulty in finding out patrons who tamper with milk. I may say that in my experience there is not so much tampering going on as has been given out by several gentlemen. I have no doubt where there is no system of inspection a good deal does creep in. I have taken hold of factories where at first quite a number of patrons were rinsing there pails with water, after straining their milk, and I had no difficulty in remedying that trouble by close inspection. It was tolerated by the proprietor of the factory before I took hold of it, and of course it grew, almost every one rinsed his pails. With the system of inspection which was suggested this morning, there would be no serious trouble in checking these practices.

Mr. Haggarty.—I would like to ask the question, would our cheese be any better if that half-pint of cream that, I am sorry to say, our patrons remove from the milk, were left in it, or is the cheese any the worse for that being taken off? We are all aware that in the vat a large amount of what we call whey butter rises on the whey. Why is not that amalgamated with the cheese? Does it not show too much butter in the milk? Might not the patrons as well have that as have it in the whey?

Mr. Macpherson.—That is an important question, and one that a good many have considered? Taking off a certain portion of butter from the milk no doubt affects the quality to a greater or less extent, and affects the yield also very largely, but the loss that is occasioned in the way Mr. Haggarty mentions it, is impossible to provide against. You will understand that the cream is held in suspension in globules through the milk, and the rennet causes the formation of a solid mass before the surplus moisture can be eliminated. It is necessary to cut this curd into small particles—half an inch, more or less—and the particles of cream that come in contact with the knife are all liberated in the whey; hence it is impossible to make cheese without liberating some of the cream that is held in the particles of curd.

Mr. Thompson.—The finer you cut the curd the more cream is liberated?

Mr. Macpherson.—Yes; that is why Mr. Whitton preferred cutting coarse. The coarser the curd is cut the clearer the whey can be made in the beginning. There is this difficulty, however, it takes a little more skill to make cheese from coarse curd than from fine cut, because the coarse curd contains more moisture, and requires more manipulation

in the after process to eliminate sufficient moisture to make it the right consistency for producing the article of cheese that commands the highest price. In breaking up curd very fine, whey is allowed to pass off more freely, and the cheese will be drier, and, of course, there will be more cream. Hence it is advisable to cut the curd as coarse as possible under ordinary circumstances, and handle it to assist the escape of moisture in the after process. The cutting of the curd too fine has a tendency to eliminate too much moisture, and make a dry cheese. You lose in two important respects under this system, in quality and quantity. In coarse curd-cutting, however, particularly in summer, the cheese-maker requires considerable skill, and has to manipulate his curd with more caution.

Mr. H. Bissell.—Referring to Mr. Haggarty's question, I hold that if the whey is drawn sweet at the proper time it is almost impossible to get enough whey butter on the vat to grease the cheese. If you go into a factory, managed on the old system, where they allow too much acid to form in the curd, you will find them getting their whey butter by the pailful. I hold that where a certain amount of acid is allowed to develop in the whey it cuts a proportion of butter out of the cheese, which would be impossible if the whey had been drawn sooner. I would like to hear Mr. Whitton's opinion on that.

Mr. Whitton.—You are perfectly correct. That is my opinion exactly.

Mr. Kidd.—Does leaving the curd coarse cause cheese to ripen earlier?

Mr. Bissell.—If you cut the curd coarse you must artificially expel the moisture, because if you retain too much the curd will be weak, and will have a tendency to ripen quicker; but I think the ripening process of cheese depends more on the amount of rennet than we have given due attention to in the past. I believe that in the summer months the makers are using too much rennet, which has the effect of ripening the cheese too rapidly.

Mr. Thompson.—I would like to know Mr. Whitton's method of testing: he has not told us yet what it is.

Mr. Whitton.—My method is with the lactometer, similar to Mr. Macpherson's, but with the lactometer, thermometer and Cheesman's test combined. I think it is a good milk test. The process is slow, but it brings it home every time. I cool the milk first, to bring it to an even temperature.

Mr. Thompson.—I have been in the habit of heating it to nearly animal heat and then letting it cool. I have worked upon the idea that the cream rises better while the milk is cooling than when it is set cool

MILK STANDARDS.

Mr. James Cheesman, editor of the *Dairyman*, next addressed the Convention on Milk Standards, and the modes of testing milk. He said:—I have been asked to say a few words on the subject of Milk Standards, and the modes of testing milk. Last year, at Belleville, I had the honour of submitting to the Convention a process for testing milk by the aid of a simple tube, requiring the use of ether and alcohol, and which occupies about thirteen or fourteen minutes to make, but only practicable in the hands of skillful men like your instructors, and which it is only necessary to use in extreme cases, where the samples of milk have been found defective on the application of the tests which Mr. Macpherson has made use of to so much advantage. Now, with regard to milk standards, they differ very materially. In England they have a standard slightly above that of New York, which, as Hon. Harris Lewis has said, is twelve per cent. In England it is about twelve and a-half per cent.; not that that is a sufficient standard, but they think it would be unjust to prosecute any one furnishing milk for public consumption which is up to that standard. In Boston, again, they have what is regarded as a very high standard, registering thirteen per cent. of solids, and you will be surprised when I tell you

that of over two thousand samples submitted for analysis to the city chemist there, fully ninety-five per cent. were found to be up to that standard. Judging from my own experience of Canadian milk, gathered from personal contact with men furnishing it, the examination of samples, and the facts I have gathered from Mr. Macpherson's experience, I think it would not be at all difficult to place the standard at four per cent. in Canada, and to prosecute only those who came below three and a-half per cent. as ascertained by the lactometer. That is merely fat measure, but it is very largely used by Professor Roberts at Cornell University, who has used the simplest means of determining the fatty constituents of milk. I believe this view is endorsed by Professor Brown, than whom perhaps no one has given more attention to this subject. I think it is very necessary that our Association and the western men should agree upon some standard, or adopt the modified practice of our friend Mr. Macpherson, of ascertaining what is the standard of each patron's milk, furnished in the untempered condition, and require him to furnish milk up to that standard. Or there is another practice which Mr. Whitton has adopted; that is, taking the standard of his own cows, which give about four per cent. of fat, and requiring patrons to furnish milk of quality equal to that. I think there would be no injustice in this, and that it would work extremely well. I think there would be no injustice in prosecuting those who fail to reach the required standard.

With regard to cow competitions, it seems to me that the question of economy has been very ably served by the cow competitions we have had during the last two years, commenced at London, and continued at Toronto in 1885. But there were defects connected with these competitions, of which most of you are aware, which led to many complaints on the part of the advocates of rival breeds. The Holstein men felt particularly bad at the results stated in the report. I am not going to talk this afternoon of this or that particular breed, but to invite your attention to the facts obtained from these public competitions, and to show you that good, useful, economical cows can be had from all breeds. In the London competition the Holsteins were lamentably beaten, and were discouraged from entering in the Toronto competitions in 1885. Last fall this was remedied, and the Holstein men plucked up courage and made some entries, but towards the last they were a little afraid of the results, whether from inability to feed sufficiently well to produce a high standard or from some other cause, I will not presume to conjecture. At that competition the Holsteins came out by long odds ahead of all the other cows, notwithstanding the fact of highly bred Jerseys being placed in competition. But there was this defect. The man who obtained the high position with the best cow I ever looked upon had only 11.62 of solids, and the milk was so poor in butter fats that it required forty-nine pounds of it to make one pound of butter. He was anxious for a large quantity of milk, but it was obtained at the expense of quality. The reason I have called your attention to these rather dry facts is to induce the Association to give more attention to competitions of this kind that may be invited by the Provincial or Toronto Industrial Exhibitions, so that some regard may be had to the cost of producing milk, no matter whether Jersey, Ayrshire, or some other breed of cow is employed. The per acre value of milk, butter, or cheese from any particular farm, is a very important question of economy, and, at the same time, unless the dairy associations take up this question it can hardly be expected that the Toronto Industrial or our friends of the Provincial Exhibition, which has done so much useful work, will do it for us. This Association has a very strong and direct interest in this matter. To show you the importance of this I may say that Mr. McCrea told me this morning that he has a very young cow, who in her two-year-old condition, heifer form, gave, I think, over 7,000 pounds of milk in one year. In ten days she gave an average of 70 pounds per day; and in one week her milk yielded 21 pounds of butter. The point is that this valuable maiden animal has never been brought forward to be tested at these public competitions. Again, when we learn from the returns furnished to Mr. Blue that the annual yield is only 2,700 pounds for the eastern part of Ontario, and 3,000 for the western portion, while it is no uncommon thing for a highly bred grade to give 7,000 pounds, the disparity between the figures is very evident. In Great Britain the average is 4,500 pounds per cow, a considerable improvement on ours. In the United States the average varies considerably in every state.

While speaking of this per acre produce I would like to call attention to Professor Brown's experiments in permanent pasture. He has assured us—and his work has been open and above board, and under strict supervision—that he has been able to pasture on one acre, with which he has been experimenting under the system of permanent pasture, two cows. I do not presume to say that permanent pasture will be possible for every one, but it will be possible for a large proportion of the area of Ontario, and has great advantages over the land not devoted to grass production. I understand that the average is four acres per cow. Now, Professor Brown has been able to maintain two cows to the acre, and raises something over 7,000 pounds of milk per acre in the six months of the cheese manufacturing season. These are remarkable facts, and call for our attention, because unless we are able to solve some of the problems lying behind dairying, the cheese factory, and the creamery, it will be impossible for us to make that profit out of the dairy business which would be otherwise attainable.

A Member.—Was any grain given to the animals you speak of?

Mr. Cheesman.—No grain was given to them. I think about twenty-five pounds of mixed grass seed was sown, together with ten pounds of clover, at a cost of from $4.50 to $5 per acre. I think economy may be very greatly advanced if this Association could spare only $50 to be divided into prizes for three classes of cows, the best milk cow, the best cheese cow, and the best butter cow, irrespective of breed. We have had some remarkable tests during the past year. In the month of September they had a test at St. Paul which proved very little, because they did not know the cost of producing the milk and butter yielded, but they had remarkable animals; a very remarkable Holstein, yielding 59 pounds of milk per day and two and two-fifths pounds of butter. On the other hand the Jerseys that were entered in competition with this highly bred animal were only second and third rate, and came out rather low on the list, giving only two-thirds to three-quarters of a pound of butter per day. In our own case we obtained results very much ahead of that. At Sherbrooke, at the test I had the honour to conduct, we were unable to obtain comparative results as to the value of breeds entered in competition, as we had only Ayrshires. The results of these tests show in a very forcible manner that there would be no injustice in adopting some of the standards to which I made reference in the early part of my remarks, because it would be quite possible to fix the standard as high as I have named, thirteen per cent. of solids. Nearly all of the men who entered cows in these competitions were men unaccustomed to high feeding to produce a great yield, but had farms which gave an enormous bulk of milk of a rather poor quality. So there would be no injustice in adopting this standard of twelve and a half and thirteen per cent. of solids as the standard of milk to be delivered to you. Now if the Association should resolve to offer special prizes to encourage farmers to put their cows in competition, I think a larger number of animals, and of a higher class, would be brought together. Hitherto prizes have been small, running from $5 to $15, scarcely enough to justify farmers at a long distance entering their cows. Mr. McCrea, for instance, if the prize were $25 or $30 might have some chance of paying the cost of transit. Again, something might be done to determine the cost of the production of milk, butter and cheese per acre, regardless of the kind of animal that may be used for the production of the milk. If this is done, I think at this time next year we will be in possession of some new facts such as Mr. Whitton has given us this afternoon, which will do much more than one or two hours' discussion in enforcing the value of tests of this kind as a means of determining the question of economy.

Mr. Wade.—If this Association will undertake the matter we will be happy if any prizes are offered during the exhibition at Ottawa next year to allow them to control the whole thing and would supplement the prizes too.

Mr. Bissell.—Did Mr. Cheesman ever make a test of Holsteins at Cook's dairy at Aultsville?

Mr. Cheesman.—I hardly know whether that is a fair question to answer. It was in the month of March, just after our meeting at Morrisburg. There was a meeting of dairy farmers of the Board of Trade of Morrisburg, I think on the 9th March. I tested Mr. Cook's milk with the cream tube, and the result was the yielding of 3.7433 per cent. I also tested his skim milk, which contained .68 per cent.—nearly three-quarters of one per cent.

Mr. Bissell.—How would that do for cheese?

Mr. Cheesman.—That is up to the Boston standard, and .04 over.

Mr. Bissell.—You consider it good milk?

Mr. Cheesman.—Yes, but I know of no Holsteins furnishing milk in Boston.

Mr. Macpherson.—What is the proportion of cream usually in skim milk?

Mr. Cheesman.—It depends entirely upon the process used for raising the cream. With the separator it varies all the way from .20 to .556 per cent.

Mr. Bissell.—I understand that Mr. Macpherson visited Prof. Roberts at Cornell University. I would like him to state what he learned there. My reason for bringing this up is that we are interested in Holsteins a little here, and have spent some time and money in trying to improve our stock. If that is the coming cow we want to know it.

Mr. Macpherson.—I don't know much about Holsteins, but when visiting the Agricultural College at Ithaca, Prof. Roberts informed me that he gave the preference over all other cattle to the grade Holsteins. As milkers he finds them the most profitable. He uses thoroughbred sires.

Mr. Bissell.—I have not had much experience with Holsteins, but as far as it goes I know they are very fine cattle, and I find them fully as good as any others. I found four two-year old heifers, purchased from Mr. McCrea, giving 132 pounds of milk, which I think is a good average. That was in the month of June last, at Joseph Knapp's Plum Hollow factory. Next year I will be able to say more on this question, as we will have some heifers coming in in the spring.

Mr. McCrea.—What little experience I have had with Holsteins has been altogether in their favour. As to the standard of their milk I think it is fully up to the standard of common cattle; we have tested it and find it to be so.

INSTRUCTOR BISSELL'S REPORT.

Mr. Howard Bissell, instructor, read the following report:—

To the President and Directors of the Eastern Ontario Dairymen's Association:

Gentlemen,—It is with pleasure that I submit to you my report as cheese instructor for the year 1886. I commenced work May 17th, and finished July 20th. [Here followed a list of the factories visited.]

This made fifty-four factories in which I worked and made twenty-seven milk tests, besides visiting, when passing, several other factories not enumerated in this list. I found three factories where the makers were soaking the rennets in whey, one using tainted rennet, and the balance using rennet extract. Seventeen of these factories were using tainted or impure milk, due to the negligence of the patrons, causing gassy curd, from which none but a skillful maker could produce a fine article of cheese. Ten of these factories were drawing the whey too sweet and not stirring the curd after drawing, so making a weak cheese. Five factories were leaving the whey too long on the curd, making a very acid cheese. The remaining factories were making a fancy cheese.

I visited three of D. M. Macpherson's factories, in which the cheese was made on the time system, which Mr. Macpherson has heretofore explained. The cheese I found to be of very fine quality, and the factories must have been receiving a fine grade of milk. I have been experimenting on his system of making cheese during the past season, and I find that you can produce a fancy cheese if you have fine milk, but if the milk is old or tainted, the maker must use his own judgment and not adhere strictly to the time allowed to produce certain effects in the different stages of making.

There are so many systems of making cheese that it is difficult to say which should always be used. The maker should be so thoroughly acquainted with the quality of the milk as it comes into the factory that he will know what course to pursue in order to make the best cheese from it. In doing this, it may be necessary to follow a certain system up to a particular stage in the making, but which, if carried further, would spoil the cheese. In short, a man must not rely altogether on any system, but must use also his brains and experience.

In my travels through the country I meet with makers who are using different systems and when I find that a man is making a good article of cheese, I encourage him in his work whether he is using my system or some other, or none in particular. The great object should be the making of the best cheese, not confining the maker to any one system.

I hope no one will understand me as being opposed to teaching makers some system. It is of course necessary to have a system of making in order to work intelligently in the production of cheese; but the different qualities of milk, differences in the furnishings and conveniences in any two factories, make it impossible for the two makers to handle the milk in precisely the same manner as would be required if a system was followed strictly.

It is often the case that two cheese made from the same batch of curd will differ in quality. I have seen both porous and solid meaty cheese made from the same curd. This difference I have traced to the press, where the follower fitted too closely in the hoop or something was out of order. I would urge upon makers the necessity of looking closely after everything relating to their work. The maker should know every day before he commences the making, that everything is in good order. All tools, vats, presses, etc., should be in proper condition, especially as to cleanliness. He should watch the milk as it comes in, in order that he may know how best to work it.

The manner in which cheese should be made in the three seasons, spring, summer and fall, varies almost as much as the seasons themselves.

Spring cheese should be made with reference to immediate consumption, which is what the English market demands. In the spring milk will work faster than in summer, from the fact that the cows are feverish, and are mostly fed on the refuse from the winter's supply of food. The curd does not need as much acid, and it should not be allowed to remain in the whey as long as in summer. If it is given as much acid as in summer, the cheese will leak whey on the shelves and become hard and crumbly.

The buyers in the Brockville district find fault with the spring cheese on this account. It should break down smooth and silky when rubbed between the fingers, and at fifteen or twenty days old be fit for consumption.

The summer cheese should be made solid in body, of fine grain and texture, mellow, silky and meaty to the palate, rich and nutty in flavour. This is the time in which most porous cheese is made, and every maker should be on the lookout for tainted or impure milk, arising from the cows drinking stagnant water, which causes pin-hole cheese. Every cheese-maker who understands his business thoroughly should be able to tell by the smell of the milk as he is taking it in, whether the vat will produce pin-holes or not. If he sees the vat will pin-hole let him proceed at first as he would if the milk was all right, but when the curd is properly cooked let him draw the whey down to the curd until it will string by touching to the hot iron a quarter of an inch, then draw whey and break up the curd four or five times, and allow to mat until the pin-holes will appear on cutting the curd with a knife; then grind through the mill and stir the curd until the pin-holes dis-

appear, taking care not to allow the curd to get too hot. I am an advocate of drawing the whey sweet, but when I have tainted milk to work, I have found from experience that the acid will, to a great extent, if not entirely, consume the taint.

As to fall cheese, there has been more or less fault found with October make as being soft and mushy, caused by letting the curd get cold, and not stirring the curd after drawing the whey in order to expel the moisture. The heat should be kept at an even temperature until the curd is properly matured, by covering the vat and letting dry steam under the cover. I have been in factories this fall where the wind would be blowing in through cracks, and the makers had no covering for the vats. Under such circumstances it is impossible to make a fine cheese. As an improvement in the curing of cheese in the fall, I find that several factories in Brockville section have four tiers of steam pipe running around the curing-room, and by this means the cheese are cured uniformly. The heat from a stove, which is commonly used cannot be evenly distributed, for while the cheese nearest the fire have sufficient heat, those further away will be cold, producing bad results. Every factory man will find that it pays in the end and gives better satisfaction to the buyers and consumers to take every precaution to have fall cheese properly cured.

As I have given some suggestions to the makers in regard to their duties in connection with cheese-making, I think it will not be out of place to give a few hints to the patrons as to their responsibilities in the matter, and I hope they will be received in the same spirit in which they are offered. What I shall say will not be so much said to find fault, as to benefit the patrons themselves. If we can do anything to improve the quality of our cheese, and maintain the position which we as Canadians have taken in cheese-making, every producer should feel it to be his duty to do it. The patrons should assist the proprietor and maker in anything that would be for the interest of the factory and the making of first-class cheese.

In the first place, they should feed their cows only such food as will produce pure, healthy milk. From a close observation of the effects of a particular kind of food on the milk of a cow, the patron can soon discover the best and most milk producing kind. This opens up a broad subject on which I might speak, but I merely mention it in passing.

The cleanliness of the milking stables, cans, pails, etc., is something about which no one can be too particular, and the necessity of it cannot be too strongly urged upon patrons. There are some who, when they get the milk off their hands seem to think that they are done with it, and never care for the quality of it, or the kind of cheese it w produce. They are careless in preparing it to be sent to the factory. I have seen milk-stands that were built by the side of the pig pen, and there the milk sets in the can all night absorbing all the offensive odours that arise around it. Such milk should be sent back by the maker, and not be allowed to go in with other patrons' milk which is pure and healthy. Enough care is not taken in milking cows. The udder should be thoroughly cleaned with the dry hand before commencing the milking, and the milk should be poured through a strainer into the can. I have seen milkers wet the cow's teats by dipping their fingers in the milk, and then go on milking with it dripping from their hands into the pail. There are many such dirty practices, which are too well known to need mentioning here. Every one understands that these things injure the flavour and quality of milk, and consequently affect the cheese produced from it.

Skimming, watering and saving strippings should not be allowed under any circumstances, and too severe punishment cannot be administered to a man who is mean enough to try to cheat others in this way. Such practices must be stopped if we are to keep up the reputation we have made in foreign markets.

I feel that I can congratulate the makers and proprietors on the average good quality of the cheese which I have found during the past year. The quality of our cheese is getting better every year, as will be seen from the following extract taken from the *Farmers' Advocate* :—

Canadian Dairy Products at the Colonial Exhibition.—We quote from the agricultural writer of the *Morning Post*, who made a thorough inspection of our dairy displays. He says :—"The Canadians are trying hard to meet the markets of this country. It was in the Cheese Department that the g eatest perfection has been obtained. Here there are in all some four hundred cheese, all made on the Cheddar system

and all of a uniform high quality. Out of the 1,000 cheese shown at Frome last month, it would have been impossible to have selected fifty cheese of such uniform quality as the 400 on exhibition at the Canadian Court. This exhibition opens up a very great question for the English cheesemonger, and that is, how it happens that Canada has been able to produce so even and high a quality of cheese."

That is an Englishman's opinion of our cheese. I will quote now from the *Rural Canadian*, which will show what the Americans think of it :—

"A well-known and enterprising cheese dealer, Mr. Robert McAdam, of Utica, N.Y., says that cheese of the standard qualities, commanding the highest market prices cannot be obtained where makers are greedy to give a big average of cheese from the number of pounds of milk received. And he adds :—"The fact is, that cheese from western New York, Jefferson and St. Lawrence counties, approaches more closely to the very best September Canadians, which now have the preference in British markets against all comers." That speaks well for Canadian cheese, and we trust Canadian makers will always take a pride in keeping the place they now hold.

Prof. Robertson.—I understood Mr. Bissell to say that there was a danger of the whey becoming too sweet sometimes. Is that before sufficient acid has developed ?

Mr. Bissell.—Before it is sufficiently cooked.

Prof. Robertson.—I would like that made plain. The whey can never be too sweet. Then you say that you find makers who are using different systems. We have been trying to teach the Cheddar system.

Mr. Bissell.—Yes, but still there are different systems in use by makers : some will have a little acid in the whey, and some draw sweet. That is the way it is.

Prof. Robertson.—Do you find the system of leaving the curd in the whey after the acid develops as good as the system of drawing sweet ?

Mr. Bissell :—No.

Prof. Robertson.—Then do you condemn that ?

Mr. Bissell.—Certainly. What we are trying to do is to get them to have better buildings.

Prof. Robertson.—When you speak of drawing the whey too sweet, you mean drawing it before the heat has had time to separate the whey from the curd ?

Mr. Bissell.—Yes.

Mr. Whorry.—With regard to the hot iron, I don't think it is a good test. My experience is that the best results are to be got from having no acid at all. By using the hot iron I have had acid that you could taste upon the whey. I do not believe in it at all, and would not use the hot iron as far as that is concerned.

Prof Robertson.—This is a very important point. I have examined the making of cheese a thousand different times, and I have never yet known the hot iron to fail as an indication of the development of acid in the curd at that stage.

Mr. Macpherson.—I use the hot iron in all my factories, and find it an invaluable guide as to when to draw the whey. Much depends on the character of the curd at the time of drawing the whey. It is a question of the consistency of the curd. I will tell you what I have done this year. I drew my whey off sweet,—just at the first indication, a sixteenth of an inch on the hot iron, the first perceptible change—and kept about 100 gallons. After drawing the whey, I hand-stirred to get sufficient moisture out of the curd, poured back this whey on the curd, and left it five hours, and I made fine cheese out of it. That shows that the whey on the curd does not do the injury that the whey in the curd would. If the curd is firm before the acid develops you are not so liable to injure the cheese ; and it does not matter when the whey is drawn so much, but if the curd i soft it matters materially ; you must draw your whey sweet and harden up. The grea secret is the consistency of the curd at the time of the first change of acid ; and the hot iron is the only thing which I have found in my experience to tell the proper time to draw the whey. The great secret is to favour a certain class of fermentation up to a

particular stage, and then you have the results. There is a law working in cheese just as infallible as the laws of nature in any other direction, and what we have to do is to utilize this law; we can govern results only when we have these things under our control.

Mr. Ashley.—Is it not possible to have curd sufficiently cooked, and still have the whey so sweet that it will not string on the application of the hot iron?

Mr. Macpherson.—Yes.

Mr. Ashley.—Then you could draw whey before knowing by the stringing of the curd?

Mr. Macpherson.—Yes; if you cut curd very fine in the start you of course give opportunity for the whey to pass off very readily, and thus eighty-three or eighty-four parts of eighty-seven will pass off from the curd much more readily in the fine than in the coarse condition. Hence, if you cut your curd coarse, you must draw your whey earlier, so as to artificially expel the surplus moisture before the acid takes hold of the particles of curd. The secret is the acid that forms on the inside particles of curd, that has a disintegrating effect, and does the injury—that is, the acid that forms inside the particles of curd, where there is too much moisture. You must have the right proportion of casein moisture just before the acid begins to develop, as shown by the hot iron. If you cut across and find the curd soft, then the whey must be drawn earlier and the curd manipulated to expel the whey, so as to retain only four per cent. of moisture just before the lactic acid begins to develop.

As to what Mr. Bissell has said in his paper in reference to varying the method of making at different seasons, I had the idea at one time that it required different handling at different seasons; but after having carefully experimented this year, I find only the one principle straight through; the one agent right from beginning to end. The only variation required in spring, summer, or fall is in the amount of rennet used, upon which you all know depends largely the process of curing. I must say that Mr. Bissell has given us a paper well worthy of careful consideration, and touching on many points of very great interest.

Mr. Thompson.—I feel some hesitation in differing from some of the gentlemen who have spoken on this matter, but where you have green hands, who have not had sufficient experience, I think the iron may be used. In my own experience I have discarded it altogether; and I find that those of my makers who turn out the best quality of cheese to-day do not use it. I think Mr. Macpherson struck the point when he said it is moisture in the cheese does the mischief. I try to get in only sweet milk—milk that will keep—and when the curd is sufficiently cooked I withdraw the whey, and do not use the iron at all. As soon as I find the curd working too fast, as soon as the acid begins to develop I draw the whey off.

Prof. Robertson.—But how do you tell when to draw off?

Mr. Thompson.—First by the appearance, and after that by the taste of the curd and whey.

Prof. Robertson.—Have you ever found the iron to mislead you?

Mr. Thompson.—I think I have found the iron to mislead me.

The President.—But your nose is always right?

Mr. Thompson.—I think so far as cheese-making is concerned I may say my nose is all right, but what it does not tell me my taste and the appearance of the curd and whey will. I claim that I never make a mistake in this matter myself. I think it may be necessary perhaps for those who have not had sufficient experience to use the iron to help their judgment, but I have frequently found the iron misleading. It will do so if you are in a place where there is the slightest draught upon the curd, and cheese-makers do not make allowance for that. Then, again, these strings will not draw so far in the cold

atmosphere as in a warm one, so we find that in these ways the iron does at times mislead. My experience is that yon can depend fully as much on your judgment and experience, guided by the taste, smell, and general appearance of the curd, as you can upon the iron. I find that different curds require a different amount of acid, some requiring to be drawn earlier.

At 5.30 p. m. the meeting adjourned till 7.30.

The proceedings of the Evening Session were opened by Mr. A. Blue, who read a paper on Dairying in the Eastern and Western Districts of the Province—published with the proceedings of the Western Convention, p. 27. The following discussion took place on the paper :—

Prof. Robertson.—The able paper to which we have just listened is one which would need to be more carefully studied than is possible just here to enable one successfully to comment upon it; but there are a few points I have jotted down which it would be well to rivet upon your memories while the matter is fresh on your minds to-night. The first point is that while eastern Ontario has 421 cheese factories in operation, only 249 of them have sent in full reports. Now the service of a paper, such as that just read, is so great to the dairymen of this province as to render it necessary that every dairyman connected with a factory should send in a full and accurate report of his operations during the year, which would have the effect of much enhancing the value of such papers. In this respect the west has done somewhat better than the east, 172 factories out of 293 having furnished full reports. I think it is a very important thing to have these reports full, because if we can show from them that the east is ahead of the west the western men will be led to inquire into the causes that operated to put them behind, and, learning them, seek a remedy, and so place themselves even with their eastern competitors; or if the eastern men are behind, as this report shows, they will inquire why it is that their produce commands a lower price than that of the western men, and bestir themselves to raise the standard to equality.

Mr. Blue asked some very pertinent questions regarding the causes of certain results, to which, for certain reasons, he did not feel competent to give any answer. Perhaps it will not be taking too much liberty if I venture to give my opinion as to these causes. The first point raised was that the western men had sustained during three years a loss of $315,000, that being the amount they would have received had they been able to make as much cheese out of 100 pounds of milk as is done in the east. Now, it has long been held by western dairymen that the superiority of their cheese is due to the fact that it takes more milk to make a pound of it, the effect of which is to make a better keeping cheese. I agree with them in that, but they have made a cheese so dry that its keeping properties have sometimes been such as to keep it in the pantry of the housewife instead of bringing it on the table. I thiuk this is a very important thing for the eastern men —this being able to make more cheese from 100 pounds of milk than the western men can. But while I think that the western men may never make so much as is done in the east, they ought to make more than they have been doing, and lose less annually than $100,000.

The next item I have is that in three years the eastern men have lost $488,000 by receiving less per pound for their cheese than the western men realized. When that was mentioned it struck me that the eastern men should receive at least $100,000 more for their cheese than the westerners, because England is the ultimate market of almost all our cheese, and freight costs less from here to England than from Ingersoll, therefore you should receive the difference of the cost in transport. The eastern men, instead of receiving $488,000 less, should be receiving $100,000 in three years more, on account of the smaller amount of freight to be paid. Freight is at least fifteen cents less from here than from Ingersoll, therefore factorymen here should receive a difference of at least $100,000,

and I am quite sure I am within the mark in saying that, taking into consideration the advantage you have in freight charges, your loss, as compared with western prices, has been over half a million. Now I do not see any reason at all why that loss should continue. Mr. Blue asked whether this loss might be attributed to the quality of the milk, to the making, or the curing. The quality of milk in the eastern part of the province is in my opinion quite superior to that of the west. I think it is due to the geological formation of the soil here that pastures give a richer milk; there are fewer swamp lands, and more soil that gives rich milk. Indications of this are to be found in the quality of eastern butter compared with western butter produced from cows of the same class and made by the same process. In the process of cheese-making the eastern men have used less milk per pound of cheese because they have left an excessive amount of moisture in their cheese in the past, which is perhaps in a measure accountable for its lower price, the English market demanding a cheese that can be kept. The western men have acted upon this; they sometimes thought it was necessary to make cheese so dry that too much of the moisture was expelled. Now, this was discussed this afternoon, and we find that cheese can be made to retain more moisture and still keep well if the whey be drawn sweet, or if it is drawn when the right portion of moisture has been expelled out of the curd. I find from experiment that I can have a meaty cheese with just as good keeping properties as a hard dry cheese. The demand of the market is not for a dry cheese; what is wanted is a rich, meaty cheese, soft in the body, and it may as well be made to keep, as to spoil. Another point in which eastern men are weak is the curing of the cheese. They have very imperfect buildings, and have not cured their cheese properly, which has brought down their price. It is quite possible to pull down the average price in the curing room. I would advise factory men in the east to pay particular attention to their buildings. I had occasion, when accompanying Mr. Macpherson, to select cheese for the Colonial Exhibition, to visit several factories, and I found many cheese which had been well made up to a certain point, but being chilled in the making-room the body was spoiled and the flavour gone. That first injury might be partially remedied if the curing-rooms were right. The cheese-makers of the east have got more cheese out of their milk, by imperfect curing, especially of fall cheese, but they have spoiled their reputation, and if anxious to share in the higher reputation of the west they must cure their cheese better in the fall than they have done. I do not say that the western men have not been helped in winning a reputation by the eastern men, but the cheese of the latter has not been as well cured on the average. The conclusion I draw is that the western makers, from studying papers like Mr. Blue's, can increase their profits by seeking to make fine cheese out of less milk by a better process of making and improved feeding, while the eastern men can save themselves in a few years from this great loss of half a million dollars triennially by retaining the moisture, but at the same time drawing the whey sweet, keeping the curd warm, and paying due attention to curing. I would have no hesitation about the possibility of coming into the eastern part of Ontario and turning out a cheese quite equal to, if not superior to that of the west. You have superior milk, better climatic conditions, less distance to transport your cheese, and, I fancy, quite as able men as those of western Ontario.

Mr. Ashley.—I have always contended with our buyers at Belleville that they did not pay prices equal to those obtained in the west; that we were nearer the sea, and therefore freights were less; and they have argued with me that freights were just the same. I am very glad to have this brought out. I have had a little experience with freight here similar to what they had in New York state. I have heard it stated there that a man who lived half way between Buffalo and New York paid more than one who lived in Chicago to get freight shipped to New York. I believe people can ship apples through from Michigan to the east at the same or less charges than they can be sent from Belleville. I also learn that just the same rate is charged upon shipments from Guelph to Belleville as from Guelph to Montreal. I have got the idea that the further a man lives from a seaport the cheaper he can get his stuff sent through, and that the people in Ingersoll can get their stuff shipped through cheaper than those who live closer by. Our buyers have kept us somewhat in ignorance in regard to this matter; they

have claimed that the cheese in the west was very much better. Now, we have learned from Prof. Robertson that all the conditions are in our favour; our milk is richer, the climatic influences are in our favour, and we are making on a little less. I think we should take a little more pains with our buildings. As far as I am personally concerned I have tried to build the very best, and I think I can say I have built the two best factories in the county of Hastings. The majority of factories, I find, are not up to the standard, but whether it is the fault of the makers in our factories, or of the buyers, they seem to get just as good prices as those who take special pains with their buildings; and, therefore, it is no use putting so much into the factory. I must say I think the buyers are somewhat at fault in regard to this.

Mr. BISSELL.—I must say the west is far ahead of us. I think one reason for that may be that we sell our cheese closely every week. I think our cheese is consumed in England when the cheese of the west is yet piled up on the shelves; and the markets are more apt to advance in the latter part of the season. I know if the west held their cheese this year it would make a great difference.

Prof. ROBERTSON.—It is difficult to express any opinion on that point. My own impression, however, is that the factory that sells right up every week makes the most money. The point is that western cheese, on the average, meeting eastern cheese in England will bring the higher price. It is, at the same time, not that they are holding their cheese a month later. In regard to Mr. Ashley's remark that it is profitless to invest in good buildings and make the best kind of cheese, for the reason that the man who makes a poorer article with inferior buildings gets as much money for it, I may say that I have had and have some interest in shipping cheese. I have found that either eastern or western cheese, going to England in five thousand box lots, and costing by factories the same price here, will be sold ultimately with a difference in favour of the best "makes" of five shillings per hundred weight. Men who have once got a lot of that finest cheese out of the large shipment will insist on having that and no other brand, and cheese from such factories in the west has commanded a price half a cent above the average prices. I think you will find that the cheese that sold best last year will have the readiest sale this year. The English prices are rated according to the regular quality of the cheese, and the man who has the finest will get the highest price.

Mr. ALEXANDER.—Another point is that the western factories are larger. In this section if you buy a hundred cheese from a man he is probably only making five cheese per day; so you have to buy twenty days' make to get the hundred. In the west where, with larger factories, they make twenty or twenty-five in a day, you secure a better average quality. Probably some of the cheese bought from the small factory are stale and the newer ones are too new. I think this may be one of the reasons western cheese commands a better price, that they are more uniform, and made in a shorter space of time. I have no hesitation in saying that if I should to-night offer a thousand boxes of the finest Brockville and Belleville cheese at fifty shillings per hundred weight, and the same quantity of Ingersoll at fifty-two shillings, if any were accepted at all, it would be the Ingersoll. There is no question about that. I think it must be that their average is worked up higher in the way I say; the factories are larger and the quality more uniform. In regard to this freight question, it has been assumed here to-night that all cheese from here goes by way of Montreal. That is a mistake, for a great deal goes by New York, and the competition between American railway and steamship companies is so great that they have their agents right on the Board of Trade soliciting freight. For that reason it would cost more to ship cheese from here to New York than to Liverpool. I have known cheese to be shipped from Ingersoll to Liverpool cheaper than it could be shipped from here to New York.

Mr. WHORRY.—Are not the western Ontario dairymen better educated in the caring for their milk and other details than we are in the east, having been longer in the business than we have. May not that have something to do with the better quality of their cheese?

Prof. ROBERTSON.—I really don't know how well or ill dairymen in the east are educated in that matter. I know, this however: we took the trouble in the west last

year to hold some fourteen district conventions, at which we instructed dairymen how to take care of their milk, and there has been a noticeable improvement in many factories owing to that instruction. I intended suggesting to this convention the propriety of holding similar conventions in the east, which I think would prove very serviceable. Makers are not supposed to be skilled in all the technicalities of milk. If this convention would make arrangements for a series of district conventions, to be attended by their own instructors, I think I could arrange to give a fortnight or three weeks time in February, and help you, so far as I am capable of doing so, to raise the value of your cheese to the standard of the west. I should be very glad to render you that service, and am sure the Department in Toronto would be quite willing for me to do so.

The PRESIDENT.—And there is no doubt we should be very grateful for that assistance. I think Mr. Alexander is right in his contention about the large factories. They have, as I described this morning, factories where they can control the atmosphere so that summer heat and winter cold do not interfere with their operations. It is quite impossible in one of these old dilapidated buildings, such as we have too many of, for a man to control and handle his milk with the same degree of success as in a perfect factory with the temperature under proper control. Perhaps in the west people do not want their milk made up for about nothing, and there is not the encouragement to start up little factories in every locality in opposition to the old substantial factories. The encouragement to build large factories where twenty or thirty cheese per day can be made does not seem very great here. We will have to take hold of this matter, and by united effort encourage the erection of first-class buildings. This big loss we are sustaining of $488,000 is largely due to our not having our factories properly built and equipped, so that work could be carried on at all seasons of the year with the same results. It is easy to see that if we export 600 cheese from our best factories and 400 from our poor ones when they are distributed among the people of England they will probably never order from this part of the country again, while if they receive 1,000 perfect cheese from Ingersoll they will be satisfied, and order from there again, even should they have to pay more money for them. This is a remedy which it lies with us to remedy. You are men of skill and ability in business, and if your skill and ability are employed in better buildings with superior appliances you cannot fail to accomplish that which it is our plain duty to do.

Mr. WHITTON.—I understand that the fact that in the west a uniform size of cheese is made may have something to do with this matter. Here in the east the smaller factories are making cheese of all sizes, from fifty to eighty pounds.

Mr. CHEESMAN.—I think we are all much indebted to Mr. Blue for his paper. Last fall while conning over the reports of 1883-4, I was very much struck by what appeared to me the natural advantages of this part of the country over the west; and I wrote to Mr. Blue, asking him if he could extend his inquiries so as to ascertain what breed of cows were used here and what in the western part of the province, and also the feeding value of the stock raised here compared with those raised there. He wrote me back that it was not possible to so far extend the scope of the inquiry, so we lose a very important factor. I think what Professor Robertson has said justifies the conclusion that the superiority in this part of Ontario is largely due to natural conditions, partly climatic conditions and partly the geological character of the country. I alluded to the fact at the Belleville convention that in Quebec creameries the percentage of butter is found to be higher than in the creameries of Ontario, and the butter is in other respects superior in quality. I think this proves undoubtedly that there exist in the east conditions more favourable than are found in western Ontario. That being so it is of the utmost importance that we should make the most of these natural advantages. It seems to me that Mr. Blue's paper would be very suitably supplemented by a report of prices obtained by the leading combinations in this part of the Province, which would have a most convincing effect on the slipshod makers of whom we have heard so much this morning. I think the facts which Mr. Blue has given us would make a very convincing and useful pamphlet about the size of a four page postal card, which might be distributed among the people attending the district conventions proposed by Professor Robertson.

EXPERIENCES AND LESSONS OF THE INDIAN AND COLONIAL EXHIBITION.

Professor Robertson, of the Dairy Department of the Guelph Agricultural College, gave an address on the Experiences and Lessons of the Indian and Colonial Exhibition. He said: I am rather unfortunate to-night, in being required to present you with a report of my work in connection with the Colonial Exhibition without having had any time in which to commit it to paper. I had access to my trunks only half an hour before I started for this place, and found my books and papers in such a very crude state that I had no other resource than to prepare notes of my report as I came down in the cars to-day with my friend Mr. Blue, and I am sorry that I have not my matter in better form.

The aim of those who proposed and promoted this great exhibition in London was to bring together evidences of the resources, products and manufactures of the different colonies, for the promotion of the commerce of the empire. There was no idea of making the exhibition a competitive one by giving awards of juries as to the particular merits of any class of exhibits—the only competition that existed being a friendly rivalry between the different colonies as to which of them could bring forward the most conclusive evidence of its national prosperity and commercial wealth and strength.

In making the arrangements for the above purpose the Royal Commission who had charge of the exhibition obtained the use of the South Kensington buildings, which in past years have been used for exhibition purposes. These buildings are quite extensive, and very well adapted for such uses. The main building is arranged in long galleries or avenues—we call them galleries, but they are just long sheds constructed of wood and glass. The two galleries near the main entrance were secured by India, Ceylon, etc., and the cross ones leading from these to the rear gallery were apportioned to Australia, New Zealand and other colonies. To Canada was assigned the very hindmost gallery of the whole from the main entrance. Now, although this location assigned to Canada was not of itself perhaps either the most desirable or advantageous, the Canadians, by the variety and extent of their display and the tasteful manner in which it was exhibited, made their court the most attractive, best patronized and most highly praised in the entire exhibition. When for the first time I walked over the Canadian court it gave me much pleasure to note that it was well attended by the visitors. In looking over the chart I had been rather surprised to find Canada relegated to such a back seat, but after going into the Canadian court and watching the stream of visitors who thronged it all the time the tables appeared to be completely turned. The attractions of her gallery made it the centre of the whole exhibition, both as to the appearance of the exhibits and the interest which they awakened in the public mind.

The intention was that the exhibition should last for six months—as a matter of fact it lasted six months and ten days—and the attendance during that time was something surprising for an exhibition of its class. During those six months it was visited by about five and a-half millions of visitors. A million is something more easily spoken of than comprehended, and it will perhaps convey a better idea of the attendance when I tell you that it was visited by an average of 38,000 people per day for the whole of the six months and ten days—the largest attendance on any one day being over 80,000. You will be able from this to conceive the advantages to be derived by this country from having its products examined by this incessant stream of thirty-eight thousand people per day, and also see what a great stimulus to emigration will result from the impressions left on the minds of these people, a stimulus the effects of which will probably be beneficially felt by this country for twenty-five years to come.

I have said that the only competition was in the nature of a friendly rivalry. The space allotted to Canada was far too small to permit of our making the display we were prepared for with the goods sent over. But there is no blame attachable to any one for that. Canada got her own share, the lion's share after all; because, with the back gallery we got two side wings, enveloping the whole exhibition. Then, late in the season, when a deputation from the Ontario Beekeepers' Association arrived, they got possession of a building in the south part of the grounds for a display of honey, so no matter where

the visitor went he was confronted by the products of the Dominion of Canada. I was rather struck with a remark I heard one day when following after a family who were visiting the Canadian court. A little fellow, one of the family, turned to his mother and said "Ma, will we never get out of Canada?"

The time at which the exhibition was held was perhaps the most fitting that could have been chosen, the population of the whole empire having shortly before had their attention drawn to the possibility of a closer administrative fiscal and defensive union of the integral parts of the empire. A full recognition by the different colonies of each other's resources, habits, manufactures and commerce, would make perhaps the most substantial foundation for any such agreement or federation. Indeed, if any such federation should ever be consummated I think the credit will be largely due to the success of the Colonial and Indian Exhibition, and the facilities which it afforded the nations,—I am speaking of the nations or colonies of the empire,—of becoming acquainted with each other in the manner just indicated.

The courts of the exhibition may be said to have been a series of object lessons, informing the visitors what each country could and did do; making a succinct history of the agricultural and commercial development of each colony. Those who visited them could not but leave with a higher estimate and juster appreciation of the value to the mother country of both Canada and Australia. When I was in England some two years ago it was no uncommon thing to hear Canadians spoken of as "those blawsted colonists," but I think the most ignorant Englishman, Scotchman or Irishman, who visited the exhibition and saw the extent and variety of our products must have been convinced that this is just as good a country as his own, and has just as enterprising citizens.

There are a number of lessons which we as exhibitors have a right to expect to realize from this exhibition. All exhibitions, I think, are helpful to those participating in them. There is a stimulus given to exhibitors from the recognition of prospective competition in their own particular lines of business. When two men exhibit any two articles in any show,—even if there be no award—the one examines the others goods, and if he finds in them any points of superiority he is stimulated to go home and endeavour to improve his own goods up to the other man's standard. I hold that there are lessons of this kind to be learned by the Canadian dairymen in connection with the Colonial and Indian Exhibition, and as all of you were not there it shall be my task to-night to give you an idea of how your products compared with those of others, in what points they were lacking or superior, and, if possible, to give you some hints as to how the defects may be remedied and your goods, as a whole, made to equal and excel the best in the English market.

There is a stimulus too in this way. An exhibition like the Colonial and Indian tends to improve trade by creating a demand for the goods exhibited. I did not expect any such result to flow from this Exhibition before I went there, but this was the consequence nevertheless. An English tradesman when he went into the Exhibition would pass through the long lines of galleries. His eye would light on something as he was passing along, and he would say to himself "That would look well in my shop," "That would sell well in my town." He would at once make inquiries as to where he could obtain a regular supply and what he would have to pay for it. I have had lots of examples of that kind. I have heard men say, "Well, I have never sold anything but English goods, but if I can regularly get something like this I am ready to take hold of it." I think we shall experience much benefit in consequence of this in subsequent years. Many shop-keepers came there and were much surprised at the excellent quality of the Canadian cheese and butter, never before having had encouragement to test for themselves the quality of our goods, and without prejudice compare them with others.

Then private citizens would come along, wanting to taste and examine all they could lay their hands on. Doubtless these people would often go home and inquire of their retailer why he didn't keep Canadian cheese and butter,—I am speaking of that exclusively, though the same applies to all other departments. I have had many shop-keepers write me stating that customers of theirs had tasted the Canadian butter and cheese at the Exhibition and spoke highly of them. In consequence they asked where they could procure some for steady sale. In this way I anticipated much gain from the inquiries of

private consumers. Of course in these cases, instead of supplying the retailers I invariably referred them to some wholesale firm, because had I let them have ten or fifteen boxes I would have been encouraging something that could not have been continued, whereas, in referring them to men from whom they could get regular supplies, I secured the co-operation and hearty support of the wholesale men of London, instead of incurring the jealousy and opposition to which the other course would have given rise.

A number of individuals in and out of the exhibition, anxious to secure for themselves soft berths,—for which their limited abilities eminently qualified them—had mooted the plan of establishing a large emporium for the reception of Canadian cheese and butter, with which they proposed to supply the retail trade. I saw that the position of the wholesale man would make it impossible for that concern to sell goods at the same price as the wholesaler. Their expenses would have been so high, something they would not have been long in finding out. In all cases of this kind I think he best serves the interests of his country who encourages as far as possible the already established and legitimate channels of trade, and lends no countenance to these commercial excrescences.

Now, there was a friendly rivalry between the colonies, the provinces of Canada. There was unfriendly rivalry between some of the other colonies, but that of Canada was mostly friendly all through. I cannot, however, help saying that the display of dairy goods from the province of Quebec was most discreditable, both to those sending it and to whomsoever had it in charge ; a worse lot of cheese I have never seen, even from our poorest factories. I hope those who sent it there will have the satisfaction of hearing of my statement. I had the pleasure of taking the Hon. Mr. Ouimet, the Minister of Education for the province of Quebec, to examine these goods, and I think, after having seen the Ontario goods, he felt somewhat nauseated by the appearance of those from his own province.

And now let me rehearse the steps taken in connection with the Ontario exhibit. The Dominion Government had made the friendly decision that they would pay the freight on all goods offered for display, and the Ontario Government agreed to advance money to pay for all goods sent forward. So the dairymen are equally indebted to both Governments for help in the matter. The selection of the cheese was left largely to the Presidents of the Dairymen's Associations. Perhaps our friend Mr. Macpherson, although not president of either Association, gave equal help in the selection—he represented eastern Ontario. I am happy to be able to say that the cheese sent forward was, on the whole, a very fair representation of our Canadian products, and at the same time very creditable to those making the selection.

There was a considerable amount of discussion in the Canadian press about the advantages which would accrue from having a continuous display of cheese at the Exhibition. For my own part I do not think that such a display in the summer would have done us any credit or service unless some competent person had been present to point out its superiority. The mere fact of a lot of cheese standing there on shelves would have been of little value, and after standing there a couple of weeks they would have assumed a repellent appearance rather than an attractive one—which indeed was the fate of some cheese that stood there during the summer. Therefore I do not feel any regret that Ontario did not make any display in the summer. In fact, I think the fact of our not having done so, was the cause of our receiving some very valuable help which we might not otherwise have had so fully. At the time the Ontario exhibit of butter and cheese arrived at the Exhibition, the London and English press generally had pretty well threshed out the novelty of the rest of the display.

This fact was helpful in getting a large amount of gratuitous advertisements, and I believe our exhibit got more press attention in four weeks than any of the rest did during the whole six months, which was one of the advantages arising from the exhibit being deferred to that time.

Now, to be specific as to the lessons to be learned by Ontario dairymen from this Exhibition. It was expected that the exhibit would attract the attention of importers, merchants and shop-keepers, and that this would result in increased orders for cheese. Well, a good number of wholesale men told me they would buy Canadian cheese next summer in preference to American. I am also able to state that other houses which have

hitherto imported only American cheese have asked the names of Canadian shippers, and are prepared to open negotiations with them for receiving Canadian in preference to American cheese. And just here let me say, that no importer ever discovered from me that there were two parts of Ontario ; the cheese shown was Ontario's, and the eastern part got equal credit with the western, so that the race for these new customers begins fair, and you will have an equal chance with the western men.

This also, I think, will be profitable to dairymen here. Instead of courting praise from experts I encouraged their criticism, for the reason that one who is acquainted with the quality of only one country's cheese, is not so likely to see faults in it as an independent observer, who could sometimes point out defects that had quite escaped our observation before. I courted fault-finding for the purpose of discovering as much as possible the defects which existed, and for ascertaining the means of remedying them, some of which I will point out to you in a few moments.

I have spoken of the advantage of having the attention of the general public called to this matter. Now, to give you a further idea of how largely the public were interested in the exhibit, I will tell you something of the way our exhibit was written up in the newspapers. The press is a pretty fair indicator of the amount of public attention given to any particular subject. If it is worthy of public attention it will be written up by the press, and if it is not it will usually say little about it.

Now, Ontario's display of butter and cheese had, at the time I left England, received notices in the press which would amount to 300 miles of single column, and since that time I am confident we have had at least 300 miles more of newspaper print concerning her dairy exhibits in England.

This also was accomplished. The resources of the province have been brought before the public in the very best possible way. Wrappers about the size of this (illustrating) were put around small samples of cheese, and on the wrappers were printed facts such as the following :—" Ontario has 742 cheese factories and forty creameries." "Ontario makes cheese which sells in the English market for four shillings a cwt. above American." " Ontario has a fine climate for dairying." " The average rent of farms is so much, etc." About 40,000 samples of cheese were distributed enclosed in these wrappers and have gone to English homes, which will be in favour of Canadian farmers for years to come.

This also is worth noting. Capitalists of England will be led to see that Ontario, instead of being a barren wild, is a fertile country, capable of profitably producing large quantities of cheese, apples, honey, butter, and so forth. Many capitalists will be looking for investments here. All of these things will help our material prosperity.

The quantity of cheese taken was something representative of the vastness of our industry. There were eight monster cheese of 1,000 pounds each, and 618 boxes of the ordinary sized cheese ; 300 twelve pound cheese ; 299 tubs of butter, and 500 five pound tins of butter. With all these goods we were enabled to make a very striking display, even in point of magnitude. The crowds who came there generally came in search of amusement, but they went away largely instructed as to what Canadians could and had done in the past.

The location occupied by the Canadian exhibit of butter and cheese was perhaps the most prominent in the whole Canadian Court. Canada had a large trophy composed of the various agricultural products of the Dominion :—Sheaves of wheat, barrels of flour, sides of bacon, little tins of honey, jars of apples and fruits, agricultural implements, etc. These were arranged in a most symmetrical and artistic combination. Right beside this, in a prominent place, and where it would best attract the attention of visitors, was located Ontario's cheese and butter. For this advantage Mr. C. C. Chipman, the Acting Commissioner, is entitled to our thanks. He favoured us as much as it was possible to favour any province, and afforded us every assistance in his power. Two pyramids with surrounding shelves were erected ; on the edges of the shelves were decorations of strips of coloured paper on cloth, around which were printed facts relating to the Exhibition, telling that this was Ontario's display of butter and cheese, the number of factories contributing to it, and, in large print, the invitation : " Take Home a Sample of Canadian Cheese and Butter."

I did not think that all this was quite sufficient to serve our interests as well as might be done; so an arrangement was made for side counters, at which were sold, to all who cared to purchase them, samples of cheese. The cheese was put up in penny, two-penny and fourpenny packages, and the calls for these were very numerous, there being, as I have said before, some forty thousand samples disposed of during less than five weeks. Some very large men from Canada, who were at the Exhibition, thought that to retail packages of cheese in this way was something quite derogatory to the dignity of the Government of Ontario, and even took particular pains to impress their opinions upon the minds of the authorities.

Well, I thought then, and have thought since, that the smallness of their common sense and the smallness of their commercial sense was alone responsible for their small talk. Besides, although the aggregate value of the butter and cheese of Ontario may reach millions of dollars, it all has to be consumed in mouthfuls, and the person who uses one mouthful helps to diminish the total quantity. For my part, I see no indignity connected with any honest work, be it ever so lowly or exalted. The only indignity in my opinion is, in being an idler or living on other person's means. And besides this again, I did not intend or propose to supply Londoners with cheese for nothing. Had I done so, there would have been occasion to give away about two thousand dollars worth of good, hard-earned Canadian products. The cheese sold in this way amounted to the very nice little sum of nearly twelve hundred dollars, which, I think, was very much more serviceable to us than the bare thanks of these people who had consumed the cheese. I find, too, that people will think more of anything they have purchased, even for a penny, than if it were given to them for nothing. These people who bought a pennyworth of cheese would talk over it, taste it, and take home the wrapper as a souvenir. Had it been given away indiscriminately to everyone who came along, much of this good would have been lost, and I must say that I am satisfied with what was done in retailing. On these wrappers of which I have before spoken, was also printed, "Ask your Grocer for Canadian Cheese," which will bring many inquiries to the country grocers, who in turn will apply to the wholesale men, to whom I sold all the goods I had, and thus the established channels of trade will be fostered and strengthened.

Good service was done the country by the shipment of cheese sent from here in the spring. I did not forget that I had been sent to represent the interests of Ontario in this matter, and I was fortunate enough to get possession of some of these cheese which had not been placed on exhibition at the opening by reason of their not arriving in time. Some of these I took to the Exhibition, for, although almost a year old, I was quite satisfied they would do themselves justice and credit in regard to keeping qualities. I put them away for future use in a warehouse attached to the Exhibition. Then, when some prominent dairy expert came along and made the common remark, that although our cheese was very fine it had no keeping qualities as compared with English cheese—a conclusion, I believe, based on the fact that American cheese is supposed to be devoid of keeping properties—I would sample these cheese. Among the individuals who held this opinion were Mr. Moore from Frome and Professor Fream from the Agricultural College at Downton, who thought that Canadian cheese would not show up to any advantage after seven months. I took them to this warehouse, and asked a man I had there to uncover some of these cheese. The opinion of these experts was that they were so fine that compared with them the first prize cheese at Frome Show would have made but a poor second. Now, you must remember that Frome Show is the largest display of dairy products held in all England. I told them I was very glad to hear them express such an opinion, and asked if they would be willing to state the same thing over their own signatures in the press, in the *Times*. Mr. Moore at once wrote a full article to the *Times*, making the same statement, which was published all over the world and of all the Englishmen who came in to see these cheese afterwards I did not find one to dispute that first verdict.

There is another very large show held in Britain at Kilmarnock. There were at that fair this year 645 separate entries, from all parts of Scotland, and England. Well, I decided to send some of Ontario's display there. There was no chance for me to enter for competition; indeed I did not desire it, because the prejudice of the Scotch people—I mean Scotch people who live in Scotland—might have prevented them from giving me

satisfaction in the awards; so I preferred to have the cheese sent along and examined outside the usual classes. I sent some of the best fall cheese of that year '86, some old cheese of '85, and some tubs of butter to this great show. The unanimous verdict was that these old cheese were the very finest in the building, which held over eighteen thousand cheese.

I had intended to dispose of small sample tins of butter in the same way as the samples of cheese were sold, but owing to the fog laden state of the atmosphere and its sootiness I found it would not be expedient to do so, as the flavor of the butter would be destroyed and more injury than good done. I therefore sold only one tub of butter in that manner, as butter was so much more susceptible to atmospheric influence than the cheese.

I had a great deal of correspondence with dairymen in England. Perhaps this may not be the best place to discuss it, but I hold the opinion that if Canadian dairymen could help to improve the making of cheese in England or Denmark or Scotland, they would be enlarging their own profits, because the manufacture of poor cheese anywhere has a tendency to drag the market down. Every pound of poor cheese blocks the way for four or five pounds of the finer kind, and for that reason English dairymen who came to me for help were very welcome to all the assistance I had it in my power to render them.

I found that the lack of an active demand on the English market for Canadian and American cheese was in a great measure owing to the large make of English fall cheese of a medium quality, which is stopping the consumption of much finer cheese. If we could improve the making of cheese there it would be benefiting ourselves. I would like to have the maker at every factory endeavour to improve the make of the next factory. Those who gave the most help would in the end find themselves most profited. I would like dairymen everywhere to be willing to communicate to others all they know, by which they would be fulfilling the golden rule and performing an action conducive to their own success.

Some of my correspondence was of a very amusing character. Among other letters I received one from a lady residing near Cork, who was much exercised because the cream on her milk would not turn green on top in the same way as her neighbours'. I was somewhat in a dilemma regarding this letter, hardly knowing whether to regard it as a huge joke or an honest appeal for help. I concluded to treat it in both ways, and wrote the old lady the nicest letter I could, condoling with her on the unpatriotic conduct of her cream, and at the same time complimenting her on the fact that her dairy must be cleaner than her neighbours whose cream turned green. I am afraid in some of our Canadian cheese factories there would be no difficulty in raising a nice green colour that would satisfy the most patriotic Home Ruler. I would recommend to Canadian factorymen to clean off their factories unusually well in the fall. I have found spring cheese sometimes inferior owing to the factories having been left uncleaned when closed in the month of October.

It is perhaps a digression, but a point occurs to me which I will make now. The flavour of cheese is often affected by the action of spores floating in the air, which settle on the milk and utensils, and multiplying there, induce in the cheese a peculiar ferment by their action. To this cause, in my opinion, is due the spoiling of a good deal of cheese in the spring, a number of these spores having been left in the utensils, water barrels, etc., when the factories were closed for the winter. I was convinced of this by studying the cheese-making methods of France and Switzerland,—not by personal inspection, but by reading the best authorities—where peculiar varieties of cheese are often made, simply by maintaining in the rooms a peculiar odour, attributable to germs from old cheese, which, settling in the milk multiply in the cheese, where by their agency this fermentation is induced and kept up, resulting in this peculiar flavour. Now a good deal of objectionable flavour which often characterizes our spring cheese is directly attributable to this cause, and can be remedied in the way I have indicated.

There are a great many valuable lessons to be learned by practical cheese-makers from this Exhibition. One of them is in comparing eastern with western cheese there was very much less disparity in quality than ever before. The quality of the cheese from the two districts is drawing closer to a common standard, and I may also say that the

difference in price was also less. This leads to the conclusion that many of the things we have been hinting at have partly been adopted by patrons, and that in the future we may expect to have cheese very much alike from the east and the west. Eastern cheese has hitherto borne the reputation of being open in body, weak in texture, and easy to go off in flavour. That was its reputation in the past. It is not quite like that now, but it reminds one of the story told of the boarding-house keeper's table which had a weak point and a strong point. The weak point was in the vicinity of the teapot and the strong one in the immediate neighbourhood of the butter plate. Now the weak point of eastern Ontario cheese was its texture and the strong point its flavour, and cheese-makers may learn from the Exhibition that these two points are not needed in these connections.

Another thing to be learned is that a uniform fineness of quality is necessary. It will not do to have say 90 per cent. of fine cheese and ten per cent. of medium, but all the cheese from a given factory or district should be fine; and if it is not all fine the cheese-buyer who fails to cull it out is not only losing money for himself, but helping to depreciate the character and reputation of the cheese of the country. It should be culled so fine that nothing but good cheese would be exported. In that way there would soon be no bad cheese left to cull, and by looking to this eastern and western men would help themselves very much.

Mr. Blue.—What would you do with the culled cheese?

The President.—Ship it to Toronto.

Prof. Robertson.—I have found that Toronto epicures were willing to pay a fancy price for culled cheese—specially selected for Toronto. I do not think it is well it should be so. I think it is the interest of Canadian dairymen to cultivate a demand for cheese at home by supplying the finest to the local trade.

Now, I think that much of the credit for the improvement in eastern cheese is due to the work of the cheese instructors, without whose work the eastern men would not so rapidly have gained upon their western brethren.

I would suggest that cheese-makers should keep a record of the different batches of cheese made by them; a complete diary of their proceedings every day. I have found in examining some cheese that was, as a rule, very fine, an occasional batch of most objectionable flavour. Now, if a cheese-maker kept a record, such as I suggest, when a buyer came in to look at his goods he would be able to afford him very valuable assistance, and it would also be very useful whenever the instructor called. If this record were accurately kept from day to day, were examined and commented on by the instructor, and the errors in its predictions pointed out, I think it would prove of more service to the cheese-maker than any amount of reading or external instruction. I would have it complete; not merely a stereotyped record of the days' proceedings. I would have the cheese-maker use his judgment, and, above all, make the report reliable, accurate and complete. This report should mention the date on which any lot of poor milk was received, or when there was a floating or pin-holed curd. All these little details would be valuable and instructive when he came to examine the cheese made under such circumstances, as he would observe the results and learn how to remedy defects.

I would also suggest that cheese-makers should supply themselves with a better class of thermometers. The report of a certain heat in the curd would be quite misleading in itself if the thermometer did not register correctly. Not only would the report be worse than useless, but the whole process of making would be injured by the thermometer failing to correctly register the exact temperature. I find there are few reliable thermometers in use by cheese-makers. Three degrees higher or lower than is right is quite sufficient to account for the spoiling in the making of much of the cheese. I find that some cheese-makers regulate their temperatures in much the same way as the English nurse girl whose mistress insisted on her using the thermometer to register the heat of the baby's bath. "Oh," said the girl, "what is the use? I just put the baby in the water and if he turns blue it is too cold, and if he turns red it is too hot." The cheese-maker thinks if he is not scorched or chilled the curd's temperature is all right. These cheese-makers who are so well trained with their hands and their senses are a little like the English nursemaid.

Another point to be learned from the Exhibition is the necessity for making a cheese with a rich body. We need cheese rich in texture, with a certain percentage of moisture; a cheese that tastes rich on the palate. I would not care very much, as a dairyman, cheese-maker or exporter, whether the cheese showed 25 per cent. of fat or 50 per cent. of fat by analysis, but I would care very much to have a cheese that would make the eater believe it contained a lot of fat. Western men have often so cased in the fat in the curd that the eaters of the cheese have really had to take a chemist's report to give them any faith in there being much fat in it at all. We do not want cheese made in that way; we want cheese with a rich body, and which reveals that richness on the palate of the eater. That can be done by dipping the curd sweet, or removing the whey when the curd is sweet, and afterwards mellowing it to a proper degree before the salt is added. Shop-keepers in England tell me that English cheese will retain the moisture on its cut surface four times as long as Canadian or American cheese, and that when our cheese is exposed to the action of air on the counter the surface dries out in less time. I find that cheese in which acid has been developed before the removal of the whey will dry out in much less time on its surface than that made by removing the whey while the curd is sweet.

The cheese-maker and dairyman have their interests identical with those of the shop-keeper, and if you make a cheese that will not dry out readily you are making what he will like, and of which (since making more profit on it), he will encourage the consumption among his customers. Let us have the shop-keepers of England on our side by making a cheese rich in body which, when cut, will not shrink.

Another lesson to be learned is that we must have a cheese with a perfect rind, free from cracks and projections on the edges. I find that the general conclusion arrived at is that cheese with an imperfect rind is lessened in value by four shillings per cwt.—the cheese being otherwise as good inside. Now, it does not cost the maker anything to put a good rind on his cheese, and, as I have said, it adds four shillings per cwt. to its value in England. That is to say, you can add four shillings per cwt. to the value of your cheese without incurring any additional expense whatever. It is a good plan to leave the cloth on the cheese for two weeks, first pressing it over the edges, and then when removing the cloth to oil the surface of the cheese. I find that cheese made in that way meet with much favour, the surface being much cleaner on account of an elastic bright rind being formed before the grease touches it at all. If the rind be first formed, then the application of oil afterwards gives a nice clear surface which looks much better.

Canadian cheese-makers will make their cheese worth more money in England by the simple plan of greasing under the scale boards before boxing. A slight greasing will cause the scale boards to adhere closely to the surface, and form a very good protection for the cheese from the action of the humid English air. That is a point to be remembered during the coming summer, and which will prove satisfactory to importers and those able men, the buyers, of Brockville.

Another point to which I would call attention is the cheese boxes. I find that at least 20 per cent. of the shipments to England arrive with damaged box covers. Not only was it so with the cheese shipped to the exhibition, but with the general run of shipments to English importers. There has not been very much complaint made on that score, because our boxes bear very favourable comparison with the boxes from the American side, still they are not as good as they should be.

I have a little suggestion to make in regard to this matter, and I am going to do a little agitating in connection with it. I find that cheese-buyers are sometimes a little lax in looking after their own interests in some respects, and lose sight of the wider interest of the general dairyman. A buyer will buy a lot of cheese on its merits, and when it comes to hand in very imperfect boxes he does not care to make a fuss about that. Yet it is a fact that bad boxes often knock off a part of the profit. A gentleman in England made the report that broken boxes knocked off two shillings per cwt. on a shipment. That was rather an under estimate of the actual fact. I would suggest that makers of cheese-boxes should make the rim or band of the cover twice as thick as is done now. It would cost no more money, and the box cover would strengthen and hold the box, and not split near so readily as now. When the box cover is broken the head falls out, and the cheese is exposed to view and damaged by the corners of the box above it

sinking into its rind. If this band were made double the thickness, as I have said, it would hold the nails better and help to strengthen the whole box, and not more than three per cent. would be found broken on arrival in England. Even if this change did make an eighth of a cent difference in the cost per box, that would be nothing as compared to the loss on the buyer from broken boxes. I hope that the cheese fair boards will pass resolutions that they will neither buy nor ship cheese that are not boxed in this way. If such a resolution were passed and put in the newspapers the box-makers would set about making the new style of boxes at once. I have been in the box-making a little myself, and I know that I could manufacture them just as cheap in this way as the other. I hope cheese-buyers will make a note of this suggestion and act upon it.

These, perhaps, are the main lessons I learned at the Colonial Exhibition for the benefit of Canadian cheese-makers: having cheese uniformly fine in quality, keeping a daily record of the quality of the milk, condition of the curds and the whole process of making, making a cheese that will be pleasing to the English shopkeeper, taking pains to secure a perfect rind, and using only strong, neat, suitable boxes.

In regard to the first point the cheese should be so uniformly fine that in showing a customer a lot of cheese he would find every box equal in quality, not five good and one indifferent, but all up to the mark. A buyer would rather buy a hundred boxes of medium cheese, than a hundred boxes in which he found the proportion of one bad one to every four good ones. The effect of finding one poor cheese in a lot destroys the buyer's confidence, and lessens his estimate of their value.

Then in regard to the daily record, it should be as I have said, exact and reliable. I would like to suggest to the cheese-makers, that whoever is appointed to look after this business by the Government, should be supplied by the cheese-makers with duplicates of these reports. In Denmark I found that plan was very helpful. Wherever a maker's record showed he had been in error comments might be sent back. I think this would have a strong tendency in favour of uniformity, and would prevent makers from making good cheese, say four days in the week, indifferent on the fifth day and inferior on the sixth, thus turning out one indifierent cheese out of every six made.

Then we want a cheese that will please the shopkeeper by retaining its moisture when cut, that will not show apparent richness, but will retain it and not become dry and insipid when exposed to the air. I found complaint made on this head even in private houses, for I made it my business to find out what they had to say about it. Englishmen told me that an English cheese would retain the moisture on its surface for a number of days after being cut, but that on Canadian cheese a kind of rind seemed to form. That can be avoided by drawing the whey before the acid develops on the curd, and making use of a proper thermometer.

The just profits of all business are those which spring from making goods of a superior quality. It costs no more to make goods of the highest class than to make ordinary ones, and the profits must hereafter result from the superiority of our cheese and butter.

The Convention then adjourned to the following morning.

SECOND DAY.

The proceedings of the Convention were resumed at 9.30 on Thursday morning, when, after the President had taken the chair, it was announced that the mayor of Brockville and a deputation from the town council were in waiting with an address of welcome to the members of the Convention. G. H. Weatherhead, Esq., was then introduced to the meeting by President Derbyshire, and read the following address:—

To the President, Directors and Members of the Dairymen's Association of Eastern Ontario:

GENTLEMEN,—We heard with much pleasure of your decision to hold your 1887 meeting in our good town. The very important interests you represent, and by your interest and zeal further, will assure you hearty welcome at all times and places. We rejoice to know that the dairymen of the Dominion, largel through the wisdom displayed by the gentlemen of the Dairymen's Associations o Ontario, are becomin g

educated to the importance of dairying and stock improvement, thus adding to their own and the country's wealth. Honoured by your presence in our midst, we beg, in the name and on behalf of the citizens of the town to give our heartiest welcome, and trust that your visit may be one so pleasant and profitable that you will again honour us at an early date.

Brockville, 5th January, 1887.

C. F. Fraser,
Wm. Henry Comstock,
Geo. A. Dana, Mayor Elect,
G. H. Weatherhead,
D. McDougall,
F. Gilmour,
C. P. Culbert,
J. Culbert,
V. R. Marshall,
Hugh Merron,
James Logan,
D. W. Downey,
John Stagg,
Newton Cossitt,
Alfred F. Stagg,
John M. Gill.

The President, on behalf of the Association, thanked the deputation for their cordial welcome, expressing particular pleasure at seeing among them Mr. J. M. Gill, who, he said, had been a large buyer, and a man of sixteen ounces to the pound every time. The Association were so pleased with their reception in Brockville that some of the members thought it would not be a bad thing to meet in Brockville every time.

The deputation then withdrew, and a continuation of Prof. Robertson's account of lessons from the Colonial Exhibition was taken up.

DISCUSSION ON PROFESSOR ROBERTSON'S ADDRESS.

A Member.—What class of thermometer do you recommend the use of?

Prof. Robertson.—Warranted thermometers may be had from one dollar to a dollar and a-half each. You can buy thermometers by the dozen at perhaps about twenty-five cents each, and if you have a warranted one can regulate them by it, but every factory should have warranted thermometers. I find it very convenient to buy two warranted instruments, reliable in every way, and to test the cheaper ones by them, marking the variation, whatever it may be, upon them. There is a danger, however, in this, for a cheese-maker when in a hurry may forget to make allowance for the marking. I would therefore recommend every factory buying reliable thermometers, on the same principle that they would have none but a reliable steam boiler. The question should not be one of cost.

I don't know whether there are any butter men here, but I might say that I learned some lessons in regard to butter also, as I had nearly as much butter as cheese. One thing I found was that Canadian butter-makers had been using very unsuitable cloth. It is not free from a certain starchy substance. It is the custom of buyers in England when shown butter to pull out a shilling and taste the butter off the edge of the shilling, and I found that nearly all the tubs of butter, covered with this ordinary cloth, would taste on the top from this starchy substance. Now why run the risk of having butter spoiled, as well as of giving a wrong impression of its quality? By using the best class of butter-cloth that danger is avoided. While in England I took pains to procure samples of a chemically pure butter-cloth from a firm who have certificates from chemists as to its purity. This cloth I found was used by the leading houses of England and Scotland, and I have myself inspected butter on which it was used, and found that it imparted no taste to the top of the tub. I hope the dry-goods men of Canada will take notice of this; they can obtain samples of the cloth from me, and will be supplied wholesale by the firm I speak of. I hope the dairymen of Canada will ask for this cloth, and not use the old kind full of starch. If Canadians can make the same kind of cloth so much the better, but if they cannot we cannot afford to lose the reputation of our butter by using the other.

Mr. Lynch.—Do they wash this cloth thoroughly?

Prof. Robertson.—We take this precaution, to wash the cloths and rinse them in a solution of saltpetre and water, but I find that even that does not give the good results of

this other cloth I speak of. Then in regard to the packing of the butter. You know the method is to cover the top of the tub with a salt plaster, which is supposed to harden and protect the surface of the butter from the action of the air. I find that that salt plaster becomes so much broken up by the shaking it gets in transit, that on arriving in England the salt is on one side only, and the other half is left exposed to the action of the air, and the butter to half an inch of its depth is quite spoiled from the top being unprotected in the inside by this layer of salt. I am not fully prepared with a remedy for this, but I think a partial one would be to put a piece of oil parchment paper—sometimes called paraffine paper—on top of the salt plaster while still soft. It would adhere to the plaster and prevent it breaking up with the jarring. In regard to packages, I find that tin-lined tubs meet with great favour in England, where importers prefer them. I found one difficulty with these tubs was in dumping the butter out of them entire, so as to leave it with an attractive appearance. It seemed to cling to the sides of the tin. To obviate this I would recommend the lining of tubs with chemically pure cloth, which would not cost more than a few cents per tub, and would increase its value..

Mr. Macdonald.—We find these tin-lined tubs condemned by years of experience. In our district it is impossible to get exporters to take hold of them; they claim that the tin will rust. I handled a quantity of them myself, and had much difficulty in disposing of them. The cloth lining you speak of might be of some use, but if the tin rusted the cloth would impart it to the butter. I am inclined to discountenance their use altogether in this country.

Prof. Robertson.—I find that tub-shaped tin-lined packages have the preference in the London, Cardiff, Bristol and Leith markets. I examined butter that had been kept in a Leith warehouse four months in tin-lined packages, and it was in good condition. I think there is neglect sometimes on the part of butter-packers in regard to using tin-lined packages. If the tin is scratched it will rust from the iron, but if it is smooth and unbroken no rust will come to the butter; that only occurs when the surface of the tin is broken. The next package in point of favour in the English market is the white ash tub. These, I found, as a rule, were made irregular in size, so that the package was sometimes full only to within an inch of the top and at other times too full. I think it would be well to have butter put up in net weights, and do away with the quarreling over shrinkage, and the rest of it; and for this purpose it would be well if the coopers would make the tubs uniform in size. A butter tub should be filled so full that when the salt plaster is put on, the cover will fit tight. In the tin-lined packages I found there was no rust in those filled to the top. I found that some importers of butter recommended the use of the firkin, holding 112 pounds. The Danes use a firkin holding a hundredweight, which they call a Danish cask. They meet most favour, probably in a large measure because they have held the best butter. But this is to be considered, the shopkeeper wants to be known as keeping the best, and no other butter; and they have said to me: "I would not have a Canadian or American tub in my shop at all, we don't want people to think we have American butter." Our butter has had a bad reputation. If that is the case I think we, as Canadians, should even stoop to meet prejudice. If we can use a package that people will pay more for, that is the package to make. I would recommend the making of a Canadian cask of the same shape as the Danish cask. We in Canada made ash casks some years ago—every butter-buyer has had them—but they were made with iron hoops. Nobody wanted to buy them at all—I could hardly sell them—for the hoops had all rusted and the package was positively repulsive to look at. A shopkeeper wants a handsome package that will be an ornament to his shop, and if we make this package it must have wooden hoops. Another difference is that the Canadian firkins had covers that fitted on the top, the edge of the cover going around the firkin. Now, these casks that I would recommend would have heads, so that when the hoops were put on they would be headed in. Butter put up in that way would be much better protected from the air than in the ordinary way; at all events that is the idea of many importers on the other side.

Mr. Macdonald.—If we were to put up in firkins all the butter we manufacture England would not have it: there would be no market; there are only certain districts

in England in which we can place our firkins. The demand for them is very limited. If our butter were of the same quality as the Danish there would be some justification for using the same packages, but the quality of our butter is inferior to the Danish, and consequently we would not find any market for it.

Prof. Robertson.—I would not recommend the use of these firkins for the use of dairymen at home, but I would advocate their adoption by creamery men; for the men who import Danish butter are prepared to buy Canadian creamery butter and test it with the Danish butter next year. I was able to sell butter to men who imported from Denmark, and they reported very favourably. I do not recommend firkins for dairy butter, because it goes to districts where they do not buy the best butter.

Another thing I have to say in regard to Canadian butter is that Canadian dairymen making butter on a farm or at a private dairy have used the cheapest kind of salt, and in a great many cases a coarse quality. Now, coarse salt ought not to be used in butter at all, for it should be all dissolved in the butter inside of at least ten hours. It will pay a dairyman to give five prices for his salt if he can but improve the butter. I have taken some pains during the last year to find a salt that will dissolve in one hour, for I find that the quality of our butter is injured by the salt we have been using, which requires from ten to forty-eight hours to dissolve. But, at all events, I would advise dairymen on no account to use any salt that will not dissolve altogether in ten hours. As to the quantity of salt, the evil has been on the side of using too much—making the butter far too salt. I think all summer butter should be salted with a percentage of about an ounce in the pound. There is danger with butter of its going off flavour, and in the districts where they take dairy butter they are better inclined to salt butter than to butter off flavour.

Mr. Cheesman.—Is that your practice at Guelph?

Prof. Robertson.—We have salted from one ounce to three-quarters of an ounce to the pound in summer. I found that fall butter salted with three-quarters of an ounce took better on the whole in the districts that take our best creamery butter.

Mr. Macdonald.—Do you mean for immediate consumption, or to hold?

Prof. Robertson.—I don't think it is possible to send creamery June butter into immediate consumption; I do not think it either possible or desirable. We have this circumstance to contend with; that our largest production of butter is at a time of year when safe transportation is quite impracticable, and the price at some points is at the lowest ebb. There is a partial remedy for this in winter dairying,—by having cows calve earlier and making more butter in winter—but it is hardly practicable at an early date in Canada. I think storehouses should be erected for the storage of fine quality June butter. I am not prepared to say that farmers would get the benefit of the increase of price at once. These storehouses might be used by the shippers, farmers, creamery men and butter exporters. We have in June and July a large supply of fine butter, and unless safe storage is provided here it will not be fine when it reaches England. If what I suggest were done merchants would get four or five cents per pound more for the butter, and the business would regulate itself. If the price in England were more the people of Canada would get it. Then the creameries will distribute that extra price in a few years. If the exporters of butter did make a haul the first year, they deserve it, for they have paid out enough money in past years without recouping themselves. If they did that for a few years the competition in the business would soon give the farmers their share of the increased price. I think if the Creamery Association would take the matter up and erect these storehouses and charge a rate of five cents per tub per month for storage it could be kept in the best condition for the English consumer.

Mr. Macpherson.—What is the normal temperature in which to preserve butter?

Prof. Robertson.—It is found best below 45°. There is an impression among dairymen that butter once chilled down below a certain temperature spoils rapidly when exposed again. I have no faith in that theory. The Danes put it to the test by shipping at the same time to houses in England, butter in ice storage and other butter of the same churning which had been treated in the ordinary manner, asking for a report as to the quality and sale of the two lots. The result was that the butter put up in ice storage realized on the average four shillings per hundredweight more than that not so treated.

Mr. Alexander.—Some of our cheese-makers here have adopted a system of pressing the scale board on, which saves the labour of rubbing. I object to the practice.

Prof. Robertson.—Yes, I think it is very objectionable; press the cloth on for a short time, but never press the scale boards on.

A Member.—Do you recommend taking off the cloth before the cheese is shipped?

Prof. Robertson.—Yes; I find the scale board will then adhere to the cheese, and the rind will look better.

Mr. P. McFarlane, of Huntingdon, Que., then read the following paper:

THE PRODUCTION AND HANDLING OF MILK.

The subject naturally divides itself into two divisions; first, the production of milk, and secondly, the handling of milk. As we cannot handle the milk before we produce it, we must, as a natural consequence, treat of the production first.

First, then, we will give some hints as to the proper production of milk. I suppose all of you know that milk is the only thing that will, of itself, sustain life; it will produce bone, muscle, blood, everything in fact that requires to be built up in a growing person or animal. And what is thought of it by some people? They hardly ever give it a passing thought. What should have our attention more than this same food—milk? I think it was the Honourable Harris Lewis who once said, in this town of Brockville, at a convention held here a few years ago, that God in his Providence had made milk with water enough in it, yet some people would tamper with it; some to increase their product at the factory, others just to keep back some of the strippings, or just a little cream taken from the top of the can, reconciling themselves with the reflection, "them factory men will never find it out; my milk is just a little better than my neighbour's, and we will even it up." But, alas! how often are they caught and rue the day they ever attempted it, and what excuses some will offer you when you write to them for an explanation. Some say it was their wives or some of their hired servants—anything to get it from their own shoulders.

Well, I am diverging somewhat from the point, and will now proceed to give some hints towards increasing the production of milk. It is the general rule in this Canada of ours, with those who patronize the factory system, to have their cows calve in the spring time; in some localities in March, in other sections not until April, according to the time their factory opens. Do most of the patrons think when they are patronizing a factory that the manager or salesman is going to give them large dividends, whether they send large or small quantities of milk? Each patron should ask himself this question, whether his dairy consist of ten or fifty cows: Now, how many pounds of milk can I make each cow average? If each patron would try this method how long would it be until dairying would pay? A cow that will give only say 2,500 lbs. of milk, or say 250 lbs. cheese, the most of you will agree with me in saying, does not pay her own keep, winter and summer, and the sooner her owner is rid of her the better he will be. A cow to pay well must be as well cared for in the winter as in summer. Some think when a cow is dry anything is good enough for her, and leave her out in the cold for five or six hours when the thermometer is down somewhere near 20° below zero. I say, gentlemen, how would you like to be left out that length of time without anything being done to keep you from freezing? I say it is cruel and inhuman. If you have not got water in your stables to water them, turn them out to drink and return them to the stable as soon as possible. Feed good nourishing food, not dry wood. Keep your cows sleek and fat; do not keep them in stables in which the manure will freeze when the thermometer is at zero. Treat your cattle as if they were of some value to you. When cows are properly wintered, give them proper and nourishing food for the summer.

It has been said that the man who can make two blades of grass grow where one used to grow, is a benefactor to the human race. Now, if we could get two pounds of milk where we formerly got only one, it would certainly be a great benefit to the farmers at large, and also to owners or managers of factories. Most people pasture land after it is too poor to grow a good crop of hay; now, certainly if, say, a few acres were put down in grasses of a suitable kind, so that the cows would have good grass and plenty of it, see what the results would be; we would have not an average of 2,500 lbs. milk to the cow; that quantity could be easily doubled inside of three years. Manure your land properly; treat the manure or plant food of the soil with the same care you do the food of the animal. See the enhanced value of hay when properly cured and saved; save and cure your manure pile with the same care you do your hay, and your farm produce will be doubled inside three years; your barns and granaries will be full to overflowing, and your cows' bags in the same proportion. Never grow weary in well doing; show your neighbours what you can do, and no doubt they will follow your good example—try it, gentlemen, and you will have nothing to fear from the results. Give your cows plenty of clean, clear, pure, good water to drink at all times. This is a great drawback in all sections—cows drinking impure water and making tainted milk—which means tainted butter and cheese, something very difficult for a butter or cheese-maker to overcome. Any of you know if you give a cow a feed of turnips the next mess of milk she gives is tainted with it; it is the same with impure water. I say again, and with emphasis, give your cows good, pure water; water that you would have no objection to taking a drink of yourself, and the results will be beneficial alike to the cow and the milk. Another thing which is often forgotten is salt; a cow should have free access to salt at all times. I have seen herds of cows that when you would enter the pasture with a pail in your hand would almost run over you, thinking you had salt. Now, this should not be. Cows, as I said before, should have salt and at all times; a cow that has salt regularly will give more milk than one that is salted only once in a fortnight in the summer season.

Another way to increase the production of milk is to weed out the poor cows and keep none but the best. Ten cows giving 2,500 lbs. each will not pay half as well as five at 5,000 lbs. each. Now this is not too high. I will give you an instance of a patron of one of our factories in the province of Quebec, who commenced sending on the 19th day of May last, the milk of seven cows, and sent until the 8th day of November of the same year. He sent during that time from only seven cows 35,223 lbs. of milk, an average of 5,032 lbs. per cow in less than six months. He received for the same $283.23, an average of nearly $40.50 per cow. I have not found out how much butter he made before and after the factory closed; his milk netted him 80½ cts. per 100 lbs. at the factory. I may say this was at a cheese factory—one of the numerous factories of the Allan Grove combination. I do not mention this to show how much he netted per 100 lbs. of milk, as we have factories that netted more than this one, but to show that what was done by this man can be equalled, and in some cases excelled. An average of over 5,000 lbs. per cow in less than six months is pretty fair, and within the reach of many. Now, what would be the result in this fair Canada of ours if this were the average per cow instead of what it is now? Why, farmers would have plenty of money to pay their bills to tradesmen and merchants, and they in turn to pay the wholesale merchants. Instead of the cry "hard times, hard times," money should be plenty; there is just as much money in the country to-day as there was three or four years ago, and all that is wanted is something to bring it out. Take proper care of your cows in winter, give them abundance of feed, water and salt, and hard times will disappear, as snow does before a south wind in the month of March. This, gentlemen, is the key note to prosperity. How many thousand more boxes of cheese would we have been able to export this summer had all these precautions been taken? How many more thousand packages of butter would have been made? Let us try some of these experiments; they are worth trying. Will it pay? Yes, pay large dividends, and the best of it all is that it will harm no one, but make this Canada of ours what it should be—second to none.

This, gentlemen, brings me to the second part of my subject. Since we have endeavoured to show you how milk may be produced, we will now treat on the subject of the proper handling of milk after it is produced.

Cows should always be milked as nearly as possible at the same hour night and morning; try and strain a point to do this at all times. Some will milk say at five o'clock in the morning and leave it until seven o'clock at night; this should be avoided under most circumstances. Milk with clean hands after seeing that the teats and udders are properly cleaned ; use tin pails for milking, if possible, well cleaned, as dirty pails make tainted milk. New milk is very subject to taint, therefore have everything that your milk comes in contact with scrupulously clean. After having milked your cows clean or dry, the next thought should be to cool and aerate the milk, to take all the animal odours out of it ; proper airing is of more benefit to it than cooling. Some think when they cool it that is sufficient ; stir with a dipper if nothing better is to be had. Mr. D. M. Macpherson has patented the best milk cooler I have ever seen—airs and cools at the same time.

I believe the largest number of the farmers in Canada patronize cheese factories. In olden time milk was sent to the factory twice a day, in most cases it is only sent once a day. When once aired and cooled, strain into can or cans, and keep from rain : your milk can should be protected as well as your hay. Keep it dry and if it is down at a temperature of say fifty-five to sixty, there is not much danger of it souring before morning. Milk kept in this way will make the best goods ; we cannot, at least we have not, made too much good cheese and butter. The genuine article is always in demand. I am not here for the purpose of advocating any special line, but I believe I am correct in stating that for the past ten years the associated system of cheese-making has proved more remunerative than butter-making, and the reason is not far to find. We are so far from markets—that is we make more than we need for ourselves—therefore, we export large quantities. Now, the taste of Englishmen—and I may say of most other people—is that they want their butter sweet and fresh. Can we give it to them in such a shape? Hardly, with the means of export at our service; so therefore, we cannot compete on equal terms in the English markets. But with cheese we can do so ; take cheese say at twenty days old: by the time it reaches the English markets twenty days more is taken, leaving it, say, forty days old—just about right for summer made goods. I feel proud to say that we Canadians are taking the lead of the whole world in cheese-making. Englishmen stand aghast at the strides we are making in improvements, and the Americans have also to take a back seat. How has this been accomplished? By such meetings as we are attending to-day, exchanging views, giving and exchanging notes. We have gone on making rapid improvements until cheese-making has become a regular science, and we can look back with pride on our present attainments. Still we have not reached the goal of our ambition—we must keep on in our improvements, and keep abreast of the times. Some cheese-makers of the old school look with disdain on the junior men, and look in amazement when you think of introducing some improvement. They know more than ever you did, they have forgotten more than you ever knew. I have not much hope of such men. A cheese-maker should learn something new every year, in fact, nearly every month of the year. Men who take a pride in their work, and try to excel every day are found near the top of the ladder, but when a man knows so much that you cannot tell him anything, you want to look out for him.

I need not here go into the process of cheese-making, knowing there are many amongst this large assemblage better qualified than I am for such a task. I hope and trust that these few rambling lines, which I have read in your hearing, may encourage some who have not given the matter much thought, to give closer attention to the poor cow, and if nothing more comes of it, she will be somewhat better treated. Treat her well and she will pay you well. It is an old saying and a very true one, "Feed a cow pea straw and you will get pea straw profit."

Mr. Lynch then read the following paper :

PEDIGREE AND PERFORMANCE.

The value of an animal depends upon its individual qualities as a producer, and its power of transmitting those qualities to its offspring. There are two principal means of determining this value. The main one is to make a record of what the animal has done. Animals being kept for their produce, the ultimate test of all values in animals is production. Some idea of the productive qualities of an animal may be obtained from its appearance and family history, but the surest test is the actual performance.

Another means of determining the value of an animal is by reference to the record of family performance. This latter value is based upon the fact that the quality of an animal, and its power of transmitting its quality, are dependent upon the qualities and powers of its ancestry. A history of such ancestry is called pedigree.

Neither one of these means of determining animal value is sufficient of itself. The performance of an animal, while it is the ultimate test of its productive value, is only a partial test of its powers of transmitting its individual qualities. A stronger assurance is found in pedigree.

Both in the raising and purchase of stock it is necessary to estimate the probable qualities of animals before the record of individual performance has been made—even before birth. Pedigree affords a strong basis for such estimate.

On the other hand, pedigree has absolutely no value that is not based upon performance somewhere. If there were no merit in the family to which an animal belongs, the pedigree of a century would be worthless.

This being true, it follows that the value of all performance would be enhanced by a pedigree record ; while pedigree to have any value should have associated with it the merit of excellence in performance.

There is too much tendency to forget how closely the two means of estimate are associated,—to over-estimate the one and undervalue the other.

There are those who think of pedigree as something fanciful, and of no practical value. There are others who set too much value upon a mere history of names—because it is called pedigree and has had some remote association with real or supposed merit.

But there are many who more justly appreciate both values. These are wise farmers, who will pay an extra price for an animal for the two reasons that he has the appearance of a superior animal, and possesses a creditable pedigree. Then there are breeders who have large investments in the pedigree side of their animals, who yet are wise enough to demand that pedigree be supported by performance. In this connection, it is gratifying to quote the following from extensive breeders of Holsteins—(Messrs. Smith & Powells) :—"Pedigree is of little value unless it traces to animals of superior merit and breeding, and the only true evidence of superior merit is actual performance."

Pedigree is the record of ancestry. Breeding precedes the practice of recording animals. It first happens that by isolation and some skill in breeding, distinct breeds become established. It is then seen that by the registration of all the animals of the breed, the purity of blood would be better maintained and the value of the animals be enhanced. At this point some individual, or an association, undertake to open a register. A reasonable time is then given to allow registration of all animals whose characteristics prove them to belong to the breed. The register is now closed to original stock, and a herd-book is established.

The only condition of registration while the herd-book is being established, is the apparent possession of characteristics of the breed, and the supposed power, by virtue of purity of blood, to transmit individual and breed characteristics to offspring.

The herd-book is now open to the offspring of animals already registered, and closed to all other.

While the very existence of the herd-book is an evidence of supposed merit, it is yet true that not all the animals which obtain registration will be superior. It follows that the mere fact of pedigree, at first and later, is not absolute proof of individual or even of

family merit. The real value of pedigree is that it is a presumption of merit—of the possession of valuable breed characteristics, and that it affords an opportunity for greater assurance by tracing the record back to the original, for proofs of merit.

Only a small percentage of the stock of the country is pedigreed. The main portion is outside of the herd-books. Necessarily, none of this stock is eligible to any of the existing herd-books. Among these outside animals are a great number which possess marked merit as individuals, and some of them are possessed of prepotency, or power to influence the character of the offspring.

There are hundreds of these animals, perhaps whole herds, to the value of which a pedigree would add greatly. It would also be an incentive to owners to give greater attention to improved breeding.

Now, while these animals are necessarily and justly excluded from the privileges of established herd-books, they need not be excluded from the advantages of a pedigree.

In what way may superior "common" herds obtain such advantages? Through the means similar to what had to be adopted for the different breeds, that were once in a like position—having merit without record. The means adopted was the establishment of a herd-book, in which registration was possible. In fact, to give all worthy animals the advantage of pedigree, it is necessary for each owner of a herd of such to register his own cattle.

This one may do in what we may call a farm herd-book. The requirements to the successful establishment of a farm herd-book are not difficult. The first requirement is a record book—which will be the herd-book.

This book may be on an exceedingly simple plan of arrangement, and the filling in of the record, a matter of easy book-keeping. The record should be full, clear and easily understood. It should be made promptly as the facts occur. This will ensure greater reliability, and make the work easier.

The second thing to be done is to name the herd. The name of the herd should be one that cannot be mistaken for some other. It should have a perfect proprietary character, like that of a trade-mark. One way that this may be done is to couple the owner's name with the name of his locality or his home. For instance, the Ik Marvel-Edgewood herd, the Goodhue-Sunnyside herd etc., etc.

The next thing necessary is to individualize each animal in one's herd—to give each animal a name and a number. These names may be according to the fancy of the owner; but they should be pleasing to the ear and easy to remember. They may be something characteristic of the animal as "Jumbo," "Petite," or commonplace, as "Brindle," "Daisy;" or dignified, as "Katherine," "Rosamond;" or a shorter, pet name, as "Kate," "Rose."

The number of each animal would simply be the number falling to it, in consecutive order as its name is entered on the list in the herd-book.

The cheaper way to obtain a blank record book would be to buy one, if one could be had for purchase. If not, several friends might join to have a few printed. As a last resort, a person may rule one for himself.

The next requirement is one that if not absolutely necessary, is extremely desirable. It is a uniformity of system for all the herds. This is necessary for several reasons. It would make the past record of an animal available in the event of its sale, and its removal into a new herd. It would make possible a comparison of merits, between animals in different herds. It would popularize the system, and make the records more easily understood.

This necessity makes it desirable that a standard form of record be adopted. With a view to help to arrive at such a result, I have devised a system for registration of home herds, which, I hope, will form a basis for a future standard; or which, at least, will record such facts as will be available for transference when a satisfactory standard shall have been found.

Believing strongly in the practical value of a system of home registration, and wishing to favour progress rather than possibly hinder it, this new system of registration will not be copyrighted, but is hereby made public property.

The writer hopes not to create an impression that the formation of this herd-book of the farm will add immediately to the intrinsic value of the herd. Nothing of that kind was accomplished in the cases of the improved breeds. No herd-book can give value to animals by mere virtue of pedigree. But the merit that exists and that may be developed may be better realized in values by the possession of a reliable pedigree.

Neither will all herd-books have an equal value as herd-books. Pedigrees in different books will have a value which will depend in part upon various factors—the character of the breeder, the merit of the animals, the reliability and completeness of the record, etc., etc.

The proposition to establish farm herd-books is no disparagement to the herd-books of the breeds. On the contrary, it is paying the latter the compliment of imitation. Doubtless even breeders of registered stock would do well to adopt the system of home registration. They would thus secure to themselves a better appreciation of the merit of their individual herds, and a better reward for their individual efforts. The difference between some of the herds among the breeds and some of the herds among the mixed herds outside of the magic lines, is not greater than the difference between different herds of the same breed! A skillful and painstaking breeder of pure stock by keeping a farm herd-book will be enabled to give a distinct value to animals carrying a number in his own book.

Some special advantages in the system advocated may lead many to adopt it:—

First. No one could be excluded from the benefits of such herd-books.

Second. The character of the book and the value to be attached to the pedigree of one's own herd is wholly under one's own control. Abuses in other herd-books need not seriously affect one's own, after a reputation has been established.

Third. Cheapness of the system. No fees. No cost for registration.

Fourth. Possible fullness and reliability of the record. It will be convenient to record, as it occurs, everything that will be of value as data for the future. The register being at one's hand, there need be no delay in registration; errors and omissions will be fewer in consequence. Where the books show a complete and continuous record, they will have a character of reliability similar to the day-book of the merchant, which is accepted in courts of law as proof.

Fifth. An incentive to improvement of stock and better realization of profit from such improvement.

There are other advantages common to all herd-books, as, for instance, the fact that the value of the record will increase year by year.

All herd-books have some disadvantages. Says Miles: "Animals that have been the means of establishing the reputation of the breed by their superior merit. will be found on the record, side by side, not only with the inferior members of the breed, but with those of questionable purity of blood. Many animals may trace their descent from herds that have been noted for producing the best representatives of the breed, while others will have nothing in their ancestral history to recommend them, aside from their supposed purity of blood." Miles further concludes that the "inherited peculiarities of an individual, aside from the general character belonging to the breed, must be determined by evidence not contained in the herd-books."

The farm herd-books will not secure purity of blood to its pedigrees; but constant selection and weeding out may present a record of performance that will form an excellent basis for estimate of value.

Performance is the real basis of all values. There would be little value in a farm herd-book that did not record the actual performance of the animals. But a record of actual performance would itself be of great value to every herd, even with no herd-book.

The most important part of performance is milk value. By milk value is meant the quantity of milk; and the butter or cheese value of that milk.

The quality of milk is obtained by keeping a record of milk yield. Milk may be weighed, or measured. Weighing is perhaps the most correct, and, with proper facilities, ought to be an easy and not expensive method. Whether by weight or by measure the result should be expressed by pounds instead of by quarts. Pounds have a universal meaning, while quarts vary in different countries. It is not necessary to record ounces. Anything less than eight ounces may be dropped altogether. A quantity from nine to fifteen ounces may be entered as one pound. This will make a general average of sufficient accuracy.

For convenience' sake, in weighing milk, first see that all the milking pails are of the same weight. A tinsmith can easily even up the light-weights by the use of a little extra solder and tin, on the outside bottom. Next, provide a weight that will exactly balance that of a single milking-pail. This "balance-weight" can easily be made at home, out of waste lead. Now, by the use of the balance-weight, the reading of the scales will be the actual weight of the milk. Thus all need of calculation—subtraction—is avoided, labor saved, and greater accuracy assured.

Where the facilities for weighing do not allow of the use of a balance-weight, there is another plan. Let all the milking-pans be of exactly the same weight. Record the gross weights at milking, that is, as though there were no pail. When adding up the totals of the milkings, say at the end of each month, or of a season, deduct from the totals for each cow, the weight of the pail multiplied by the number of milkings. For instance, suppose the weight of all the pails to be exactly four pounds each, and the total of 250 days' milkings of one cow to be 9,500 lbs. Having milked the cows twice daily, the cow would have been milked (250 × 2) 500 times, and the pail weighed that number of times. The amount to be deducted for tare of pail would be the weight of the pail multiplied by the total number of milkings, or (4 × 500=)2,000 lbs. The actual weight of milk, then, would be the amount of the total weighings, less the tare of pail, or (9500—2000=) 7500 lbs.

The plan of measuring milk has some advantages. It is cheap, and might be an accurate method. It would seem to require, however, a conveniently gauged vessel, that would give the measure—not in quarts, but in pounds.

As to frequency of recording milk-yields, one day in seven will do. An estimate based upon an actual record every seventh day will not vary enough from a full record to make it necessary in ordinary farm practice to make a daily record.

(This statement is supported by careful statistical estimates, based upon actual daily records, in the case of two cows subjected to more than ordinary causes of variation. These statistics show that the highest variation from the exact yield will occur in the case of some one cow for some single season. This variation will range from less than one per cent. to less then two per cent. The variation will always be less in a general average. In the estimate of the yield of the whole herd, the variation from the actual yield will be reduced to so small a minimum that the record will be practically exact. In the estimate of yield of a single cow, the variation for the whole milking period of her life will not be worth taking into account; but some slight allowance may be made, in the estimate for a single season, for a possible variation of one or two per cent.)

This one-day- in-week system of record demands several conditions :—

First. It matters not on which day during the week—from Monday to Saturday—the milk be registered, but there should be a certain record day, and it should fall always on the same day of the week, to secure an even interval between.

Second. The record may include all milkings on that day—morning and night (or noon).

Third. The hours of milking on each of the different days of the week should be practically the same; this will make "record day" a fair average of the other days of the period.

Fourth. The whole day's yield of record day must be multiplied by seven. The result will be the estimated aggregate yield of the period.

Fifth. When a cow, owing to sickness or other special cause, shows a sudden or unusual falling off, a full record of her actual yield should be kept until she returns to her normal yield.

The following is a very simple form of milk-register :—

Number of Days.	..... No ..... Calved				..... No..... Calved			
	Mng.	Evg.	Total.	Remarks.	Mng.	Evg.	Total.	Remarks.
Partial periods. 3 days	29	30	59	3 days .....177 lbs.				....days.....lbs.
Partial periods. 6 "	1	1	2	6 days ..... 12 lbs.				....days.....lbs.
7	30	31	61					
14	31	32	63					
21	31	32	63					
*	293	332	625					
196	4	4	8					
203	2	3	5					
210								
Totals of Full Periods	391	434	825					
× 7 =	.....	.....	5775					
+ Partial Periods ..	9 days	.....	189					
Full Totals.....			5964					
Weight of Pails .			1696					
Net Weight.....			4268	No. of days milking, 21.				

* The "Number of Days" in this first column is extended, by sevens, to the limit desired, as follows :— 7, 14, 21, 28, 35, 42, 49, 56, 63, 70, 77, 84, 91, 98, 105, 112, 119, 126, 133, 140, 147, 154, 161, 168, 175, 182, 189, 196, 203, 210, 217, 224, 231, 238, 245, 252, 259, 266, 273, 280, 287, 294, 301, 308, 315, etc.

The above form, if carefully studied, will almost explain itself. When a cow calves on the first day after record day, there will be a full period on the following record day. If she calves on any other day, the first period will be a broken or "partial" one. Besides this partial period occurring immediately after milking, there may be one also when drying off. Now, the two top lines across are ruled off for these partial periods. The first full period is entered opposite the figure "7"; the second period opposite "14," and so on. After the record will have been made, therefore, these figures will indicate the number of days the cow has been milking; and the figures opposite, in the columns "morning," "evening," and "total," will be the weight of milk (and pail) on record day, or in one day in seven.

After the cow has been dried off, the record is closed. Add up the third or "total" column and place the amount under the first foot-line, opposite "totals of full periods." Multiply this total by seven and set the product immediately under the amount multiplied. Bring down the full quantity yielded in the "partial periods," and set beneath it the product of the multiplication by seven just referred to. Add the two last mentioned amounts, and set in the next space, as a "full total." Now deduct the weight of milking pail, multiplied by the whole number of milkings, and the balance will be the full yield for the whole period of milking.

The "number of days" of the milking period is found by adding the number included in partial periods to the number opposite the last record of a full period. This amount may be set at the foot of the column for "remarks," for future reference.

In the above form is given an imaginary record to show the system of keeping the register. The cow was milked three days of the first period, and on "record day" she gave 59 lbs., or a total of (59 × 3) 177 lbs. For the "number of days" between "21" and "196," the record (to save space) is given in a single amount; and is 625 lbs. The last weighing was a total of 2 lbs.; this, too, was a "broken period" of six days, giving us (6 × 2) 12 lbs. Adding up the "full periods," we have a total of 825 pounds. In multiplying this amount by seven, or the number of days in a period, we get the total gross weight for the full periods; or (825 × 7) 5,775 lbs. Adding to this amount the weight for partial periods, we have (5775 + 189) 5,964 lbs.

By adding the nine days included in the partial periods to the 203 days of the full periods, we have the whole number of days, or 212. The number of milkings is this latter amount multiplied by 2; or, (212 × 2) 424 days.

Multiplying the weight of the milking-pails by the number of milkings, we have the amount to be deducted for tare, or weights of pails. Assuming the weight of the pail in this case to be 4 pounds, it gives us (4 × 424) 1696 lbs. of tare. This amount subtracted from the gross weight, gives us the net weight of milk; or (5964 – 1696) 4268 pounds.

There is less calculation in this than would appear from the long explanation that is necessary; and the little calculation does not necessitate a tithe of the labour involved in daily weighings, or in the daily subtractions of weight of milking pails.

The register may be ruled for as many cows as convenient—say one to five. A single full sheet of foolscap may be ruled conveniently to register the yield of five cows, for a whole season.

The labour, therefore, of keeping a register for five cows, for a full season, involves only the weighing (or measuring) of the milk one day in seven, and the filling out of a single sheet of foolscap—on one side.

While it is not absolutely necessary, it is very desirable to keep a supplementary milk register. Calculate, or estimate, on "record day," the full actual yield for the seven days. Divide this amount by seven, and the quotient will be the correct amount to place in the columns of the milk register for that day. The following is a convenient form of

Supplementary Milk Register.

Date.	Mng.	Evg.	Total.	Remarks.	Date.	Mng.	Evg.	Total.	Remarks.

A register board is the next requisite. This is simply a planed board to carry the register, which latter may be tacked to the board at each of the four corners. A string, nearly the length of the board itself, is fastened by one end to the top of the board, and to the other end is tied a lead-pencil, which is always kept sharpened. The board itself is provided with a hole at the top, or a string, that it may be conveniently hung upon a nail, at the stable, or in the house, and easily removed. For tacks, regular "drawing pins" are the best; failing which, take common tacks, and make up for a small head by putting on a stout leather "washer," or loose head, wider than the head proper. This is a simple and cheap apparatus, and a wonderful convenience.

A secondary object of a milk record. Cows are affected by such influences as changes in food, in the weather, by their general treatment, by disappointment, by accident, sickness, etc. Some cows are more sensitive to such influences than are others. The cow least affected by these conditions, other things being equal, is the best cow. Now the milk record is a very good index of these conditions. It is well, then, to keep a record also of these influencing changes, such as temperature of the stable; changes in feed; bad treatment of the cow, like being run by dogs; periodic bodily conditions; accidents; sickness, etc.

Not only will these records show the hardiness and relative value of the cow, but they will call attention to what are the helpful, and what are hurtful influences, and so have an educational value. For instance, if a dog be set upon a cow, or if she be otherwise ill-treated, the milk record will be affected.

Let it not be supposed that these records involve great labour or much time. If some systematic plan be adopted and constantly followed, it becomes a simple matter of a few minutes each day; and it soon becomes an interesting work to the dairyman who has set himself to improve his stock.

The butter value of milk, or its cheese value, is the number of pounds of butter, or cheese, in each hundred pounds of milk. To obtain these values for practical purposes, it is best to adopt the usual process of the dairy.

For butter value, several milkings of the cow to be tested are kept separate from the rest of the milk, carefully weighed, and the whole set by itself, either in deep cans or shallow pans. It is in usual order skimmed and ripened, then churned at one churning.

To secure correct results, a rule of process should be adopted and always followed. The following is suggested: Skim at 36 hours. Stir cream thoroughly as each new lot is added. Let the cream stand for 12 hours after last mixing, at a temperature of 60°. Churn at a temperature not above 60°, except when the cream is difficult to churn, as in winter when affected by distance from calving, dry feed, etc. Brine-salt the butter.

The rule for obtaining butter value: Multiply the weight of the butter by 100, and divide the product by the weight of the milk which produced the butter. Example—Given four milkings, which weigh as follows: 16 5-16 + 15 12-16 + 16 4-16 + 15 9-16 = 63 14-16. This milk produces 2 10-16 lbs. butter. To make the calculation easy, reduce these amounts to fractions; which, of course, will be ounces. Milk, 63 14-16 lbs.=1022 ounces; butter, 2 10-16 lbs.=42 ounces. According to the above rule, "multiply the weight of butter (42) by 100": $42 \times 100 = 4200$. "Divide the product (4200) by the weight of milk which produced the butter (1022)": $4200 \div 1022 = 4.15$. The answer: The butter value of the milk of the cow tested is 4.15 lbs. butter for every 100 lbs. milk. In other words, the butter value is 4.15% (four and fifteen hundredths per cent.).

In estimating milk quantity the ounces were not taken into account because they were averaged. But in weighing milk for test of butter value, it is necessary to be as exact as possible. The large proportion of milk to butter, about 25 to 1, introduces an element of error. An error on either side is really multiplied by 25. It is necessary to be exact to the ounce in these tests, after which we may trust to beneficent working of the law of averages.

In testing for butter, or cheese, values, it is not necessary to use a specified number of milkings, nor to adopt just the process above described; but it is necessary to treat all cows alike, and always to carry out as nearly as possible the same process in every case. Results should be carefully recorded, and kept for permanent reference.

Frequency of tests for values. Tests become of greater value the oftener they are repeated; but for practical purposes, they need to be repeated only till a certain uniformity of result shall have proved their correctness and permanent value.

For this reason, it will seldom be necessary to long continue making these tests. After a time, the butter value of each cow will be established; after which only an occasional test will be necessary, to note any variation caused by age, food, treatment, etc. It is desirable, however, when testing, that all the cows be tested in immediate succession.

An interval may then intervene, and the cows be tested again, preferably in the same succession and order. Intervals between tests may become longer as the tests are repeated and the results more uniform, until they are discontinued, except an occasional test as above explained.

A register of tests for values is necessary. The following form of register will be found convenient for butter.

No. of Test.	No. of Cow.	Age.	Days after Milking.	Days before Milking.	Consecutive Milkings.						Time of last Skimming.	Quantity of Cream.	When churned.	Temperature.	Time churning.	Butter.		Butter Value.
					Date of First.	1	2	3	4	Total.						Fresh.	Salted.	

Since all comparative tests should be made as nearly as possible in the same manner, certain conditions of tests should be adopted. The following is suggested as an example for testing for butter values. Include four milkings; allow milk to stand not over ten minutes before setting; employ deep-setting system, 36 hours; ripen 12 hours, at temperature of about 60°; salt medium, or brine-salt. Note temperature of churning, and try to churn at same temperature till the test has been applied to all the cows being tested. If it be necessary to change the churning temperature, let it be done when beginning the round anew.

The foregoing method of testing applies to farms of ordinary equipment. To carry it out no extra apparatus is required, except several milk-cans large enough to hold a single milking, a small sized cream-holder, a churn smaller than the one in ordinary use, the register and register board, and light scales or balances. In other words, all that is required is to weigh and set the milk, churn it, weigh the butter, and keep a full register of the facts. This may be accomplished, on many farms, with no extra outlay at all. In any case, the outlay need not be large.

For milk cans, or "creamers," what is wanted is a tin pail with glass and faucet at bottom, and a cover that is ventilated.

For size, one 20 inches deep by 8 in diameter will hold a little over 35 lbs. (3½ gals.); and one 20 inches deep by 6 inches in diameter will hold a little over 20 lbs. (2 gals.)

Either creamer can be used with less quantities. They can be made by the local tinsmith. Where even so small expense is not practicable, the work can be done by the shallow pans, and the churn, in ordinary use in the dairy, although not with the same degree of convenience and satisfaction; if scales are not available, the milk, with care, may be measured and converted into pounds. At ordinary temperatures, or about 60°, an imperial gallon of milk will weigh approximately 10⅓ lbs., and a wine gallon will weigh 8½ lbs. This will be sufficiently correct for purposes of test.

After recess, Mr. Henry Wade, Secretary of the Agricultural and Arts Association of Ontario, read the following paper on

STOCK RAISING.

I really do not know why I, who am not at present a practical dairyman, have been asked to read a paper. True, some twenty or more years ago I learned to make cheese. It was in the neighbourhood of Utica, and the manufacture of factory cheese was in its infancy in those days in Canada. Well, for twelve years afterwards I continued to take a great personal interest in cheese-making at Port Hope, either as maker myself, or by supervising the work of others whom I had taught. But I had given up the business

before the good work of sending out instructors was begun by the Dairymen's Associations. To whatever may have been due the merits of my cheese, it was from inherent excellence, and from practical experience gained from experiment; and I am quite sure no one could have been more pleased, during some of those hot, sultry days, to receive a visit from one of your instructors, and get new wrinkles in the art of producing cheese, from his large store of knowledge—knowledge gained from the results of many hundreds of experiments made by the best cheese-makers in the Dominion of Canada. Cheese-makers of the present day ought to be very thankful that they have the opportunity to welcome these gentlemen, who, in the words of our esteemed President, go about preaching the gospel of cheese-making in every factory in the country.

I have been a frequent attendant of the Dairymen's Association since the first meeting held in Ingersoll in 1867, when Mr. Farrington was the bright particular star, or authority, and I well remember how he was questioned. I attended a few more conventions at that period, and another when we gave up cheese-making on account of having our farms in good grain-growing order again. I ceased to attend the conventions until a few years ago, when I had the honour of being elected a member of the Board of Directors.

I confess to you, gentlemen, that, although at one time I considered myself an expert in the manufacture of cheese, now, in the light of the great advances made in science and their application to the art of cheese-making, I would prove a lamentable failure, and would have to go to school again, so to speak.

I have listened from time to time at these conventions to the rules laid down for modern cheese-making, and I am amazed at the great improvement. Enthusiastic gentlemen have told me time and time again that Canadian cheese had improved so much of late years that it brought a higher price in the British market than the cheese made by our American cousins; that Canadian cheese had made a name for itself.

To my great surprise, gentlemen, at a banquet I attended at the Sherman House in Chicago, on the 9th December last, given by the Illinois State Board of Agriculture to the International Association of Fairs and Expositions, then in convention, Mr. R. W. McGlincey of Illinois, in responding to the toast of the Dairy Interests, admitted that Canadian cheese was for some reason very much better than the American. I at once thought of our scheme for the improvement of the article by the system of visiting instructors, and the good work our Dairymen's Associations had been doing for the business in a scientific manner for this last twenty years.

Hand in hand with the dairyman is the stock-raiser. They should be co-existent—one feeds the other. The dairyman, to be successful, must produce an article of commerce which is of a superior quality; all must admit that. To do this he must have milk in large quantities, and of a good quality. Therefore the dairyman should direct his attention to the breeding of such stock as will produce him good milk in large quantities. This brings me to a subject on which I want to make a few remarks.

Most of the gentlemen in this audience are, no doubt, practical stock-raisers, and men with theories for improving stock instilled into them by education and repeated experiment. Nevertheless, a few plain rules laid down by accepted, and therefore, competent authorities, cannot be amiss. A statement of what is already known in the practice of the art is of greater value by far than the propounding of new theories of, as yet, unestablished theory, which may be proved to be fallacious; the first forming a confident basis for future progress and improvement.

"Like produces like," and "Like father like son," are two aphorisms which express the same thing and contain a wholesome lesson. Breed from the best. Farmers, do not sell your best cattle, but keep them to perpetuate your names and your wisdom as stock-raisers. If you are a dairyman keep your best milkers, and use only bulls that come of noted families of milkers. If a feeder, keep only such cattle as are in good order and fit to produce youngsters that are ready for the block at two years old. All this can only be done by a proper attention to scientific rules for breeding.

In the middle of the last century, Robert Bakewell, of Leicester, England, originated a new system, which he successfully practiced in the improvement of Leicester sheep, long-horned cattle and black cart horses. His critical study of the form and proportions of

animals and the relation these bore to the most desirable qualities, enabled him to develop an ideal model of perfection, which he kept constantly in view when making selections for breeding. In his sheep and cattle he always tried to secure a large proportion of choice parts in the carcass, though always keeping in view early maturity. Bakewell's system of breeding was completely his own, and differed widely from the usual practice at that date. He was a good animal physiologist, and used to dissect carcasses of sheep and cattle to help him in his studies; and it is quite probable that to the efforts of this man England stands to day unrivalled in long-wooled sheep. With long-horned cattle he was not so successful, these never being a popular breed. But with the cart or shire horse, as it is now called, he was more fortunate, as he improved this breed very materially.

Mr. Bakewell's system with all these animals was, first to select, wherever he could get them, animals of the best blood, as near a proper form as possible for the purposes he needed, and then breeding them to their own family blood alone, only going out of it when a manifestly better was to be had, until at last he had brought them to his idea of form and excellence. This is called "in-and-in breeding," and has proved successful by others since, under proper selections and restrictions, although not agreed to by the common sentiment of humanity, in so far at least as our own race is concerned.

After Bakewell, in the last quarter of the eighteenth century, came those famous brothers, so shrewd in character and so sound in judgment—Charles and Robert Colling—names that are handed down to posterity as the wonderful improvers of the shorthorn race. And these men adopted nearly the same system as Bakewell, after scouring the country from end to end for the best individual animals that could be found. Mr. Bakewell did improve the long-horned cattle, but it was left to the Colling brothers to improve and perpetuate in the shorthorns that wonderful breed of cattle that have never as milk producers or beef makers, been excelled. And they accomplished this by a judicious system of in-and-in breeding. Their object was to obtain the greatest concentration of good blood possible in their herds, and to work the best blood of each in their descendants, and in as great a manner as possible make it common to all. To these two men is assigned the honour of fusing the old breeds of English cattle into the celebrated shorthorn. Strange to say, their name is now in a manner forgotten, or at all events has failed of being perpetuated like the Booths and Bates with their somewhat distinct breeds, although, to a great extent, they both used Colling cattle to mix with their own herds. The Messrs Booth chose from the beef variety, and Mr. Bates got his bulls from milk strains. In this way, by the system of in-and-in breeding, they have established the present two almost distinct breeds of cattle, known at this present day by the names of the founders of the great families. As far as nationality is concerned, Scotland and Ireland seem to favour the Booth strain, and England the Bates or Duchess, while in this country no distinct success has been obtained unless either one of these strains has been adhered to.

Mr. Price, the celebrated breeder of Herefords, says, "I bought from Mr. Tompkins a number of his cows and heifers and two bulls. I have kept the blood of these cattle unadulterated for forty years, and Mr. Tompkins assured me that he bred the whole of his stock from two heifers and a bull, selected by him early in life, without any cross in the blood. My herd of cattle has, therefore, been bred in-and-in, as it is termed, for over eighty years, and by far the greater part of it is in a direct line." It will be thus seen that the greatest success has been brought about by a judicious in-and-in breeding, and by following the line. No doubt this can and has been frequently abused, but never by experts or by an artist. A strain of fresh blood can be easily brought in, still keeping to the same line of breeding.

Cross-breeding, strictly speaking, is the mating of animals belongimg to distinct breeds, and in this limited sense, it may be considered the opposite of in-and-in breeding. I have no great faith in cross-breeding for cattle. The first cross is often successful, but after that they are just as likely to go back as to advance. For dairymen I would not advise it. I was very unsuccessful myself in crossing an Ayrshire bull with grade shorthorns. Cross-breeding answers far better for beef cattle, as a large portion of our farm stock for some time to come must necessarily consist of either natives or grades produced

from them by crosses. It follows that, these animals being hard, but not good feeders, to get early maturing descendants it is necessary to cross them with the best of the beef breeds. In this way is often produced flesh as good, if not superior to the pure breeds, for it may leave a better mixture of fat and lean than can be had from the pure animals. Cross-breeding has been found very successful as far as sheep and swine are concerned; for instance, the Hampshire, Shropshire, and other Downs were all established by cross-breeding. And the same is true of swine, for nearly all of the new breeds have originated in this way.

In connection with cattle breeding I hope you will not think I am "talking shop" if I say a few words on the most important subject of pedigrees and herd books. Pedigree will not make a good animal. You should have the good animal with the good pedigree. Having money will not make a woman a good wife, but it is quite possible for her to be an excellent woman, and be rich as well. In the eyes of most men this would be an additional charm. So, with cattle, having a good pedigree increases the value of an already good animal, and, as a rule, this excellence is derived through a superior and well bred line of ancestors. I am sorry to say this has not always been the case, for, by injudicious breeding and half starving, many a pure bred animal has been allowed to degenerate into a very common looking, inferior one; and these same animals, in the hands of good breeders, would have done justice to their breed and family and have been a source of pride and profit to their owner, to boot.

In his valuable work on Stock Breeding, Miles defines a pedigree as "A record or statement of the ancestors of an animal that serves as a guide in tracing inherited characteristics. In itself, it is not necessarily considered an evidence of purity of blood, as animals of mixed blood may have a recorded pedigree, as well as those that are purely bred."

It was wisely determined by some of our ancestors, who saw the very indifferent class of cattle on this continent, in the early part of this century, to import representatives of the improved races of cattle in Great Britain as the foundation for improved breeds in this country, rather than as an attempt to form improved types for ourselves; and it has become American and Canadian shorthorn usage to deny the claim of purity to any stock not descended from imported ancestry. Others, who could not afford to import cattle, contented themselves with buying bulls of the imported stock to use with their native cattle, and after a lapse of some years the grade cattle from these crosses, to all intents and purposes, looked as well as the imported stock. The same results are evident at this day—we see grade cattle looking fully as well and even sometimes superior to imported ones. So, naturally, the attempt was made to have them recorded in the American Shorthorn Herd Book, the first volume of which was published in 1846. Cattle of improved breed had been imported long before this date—as early as 1783 to Virginia. Kentucky commenced importing in 1790; in 1803 and 1810 new ones were again imported, and in 1817 the celebrated Kentucky importation was made. In 1815-16 breeders in New York State brought out some of the same cattle. So you can see that in 1846 there should already be a great number of grade cattle in the country.

Then was the time to decide the question as to what constituted a shorthorn; but that, as at present, was a very difficult matter to deal with. Both interests were large, and probably on the side of the grades most numerous. One great argument for the grades was that in very many cases no records had been kept even of cattle descended from the imported cows, and at the late date of 1846, it would be found impossible to trace them. This helped to swell the ranks of the friends of American bred cattle. So, gradually, it came to pass that quite a number of these were recorded in the American Herd Book that did not trace to an imported cow, and some of these even had several crosses that did not pretend to trace to the same source, but instead to what we term the Kentucky woods. Mr. Lewis F. Allen publishes a letter in his second volume from the Rev. Robert J. Breckenridge, of Kentucky, to the following purport:

I think you act wisely in accepting all pedigrees which run back into English Herd Book, for right or for wrong, that is the fountain of the genealogies of the race at present. But having taken that apparently inevitable step, it seems to me impossible to refuse to take the next necessitated by that one, namely, to accept all American pedigrees as good as the average pedigrees in the English book.

Now, at that time, the English Herd Book was accepting cattle with very few crosses, but, of course, the groundwork was very different, as the Durham breed had existed in England for nearly a century before this date; and great care was taken by Mr. Coates and the other managers to accept nothing that did not come from known herds, and that rule they adhere to at the present day. Although their standard will admit a cow with four crosses, the first one must come from a reputable herd, but not from a West Highland or Galloway or even common English cow. Mr. Allen says: "A Herd Book is but a record office; it can neither settle the quality nor the title of the estate admitted to record." In that definition the breeders of shorthorns acquiesced for some time without much complaint, but in 1872, at a grand national convention of shorthorn breeders, held in Indianapolis, Ind., the dissatisfaction of a part of them was expressed in the following resolution:—"That the ancestry of all animals should be traced on both sides to imported animals before they can be entitled to registry." This called out a very animated, intelligent and spirited debate. One side maintained that as England was the original home of the shorthorn, all pedigrees should be indisputably traced thither, that all imported animals coming from Great Britain, certified to be shorthorns, whether they had written pedigrees with them or not, were equally entitled to record, and that all animals that could not be so traced, were only grades and should be expunged from the Herd Book. On the other hand, a large party held that as animals had been bred in Kentucky in more or less purity before the 1817 importation, which had been bred upon the older cattle, it would be unjust to exclude so many very fine cattle from further record, many of them having been recorded in both the English and American Herd Books already, and their present owners having purchased them in good faith. I fear I am somewhat prolix on this matter, but as it is identically the same battle that we are fighting just now, I thought it was better to give you as full an explanation as I could of how these these things stand. So, to resume, the result of all this debating was the passing of this amendment to their constitution:—"That for future registration the ancestry of the animals should be traced on both sides to imported animals, or to those heretofore recorded in the American Herd Book, with pedigrees neither false nor spurious." Since then all the American Herd Books have been amalgamated, but the same rule is in force. So, you see, that a great many of the cattle in the ground work of the American book are not pure shorthorns.

Now, why did not Canadians learn from their neighbours across the border, and make the same change in 1872 as they did? The convention was an international one, and was attended by many eminent men of this country. Canadians should have seen that the feeling for pure imported shorthorns was growing in favour more and more with the advanced breeders. But no, they did not perceive that time would compel them to do so. This is such a burning question now that I hope I will be excused if I give you a short history of our own Canadian works.

Registrations were first taken by the Board of Agriculture and Arts in 1854, eight years after the American record was begun. The standard adopted was, that no animal can be registered unless a clear and distinct connection is established, to the satisfaction of the Board, in the descent of such animal, both on the side of sire and dam, with the British or American Herd Book. It was not until 1864, ten years afterward, that enough pedigrees had been received to print the first volume. At the same time the Board, unfortunately, as it turned out, adopted the English rule of admitting cattle with only four crosses, which has proved so disastrous to breeders in this country, forgetting the great fact that the English cattle commenced from herds of well-known purity, while ours commenced from native cattle. Our first volume is very free from those grade cattle, but after that they began to increase rapidly. If they had stopped taking them in 1872, when the Americans did—and there is no doubt some such rule as was adopted there could have been passed here—the subject of herd books would not have obtained the disagreeable prominence it has.

Cattle continued to be recorded under this four-cross rule until September, 1880, causing great dissatisfaction amongst advanced breeders, as American buyers would not

purchase stock that could not be recorded in their own book, although it was by no means perfect. At a meeting of breeders, held in London during the Provincial Exhibition of 1880, a resolution was passed to the effect that the pedigree of no animal should be received for registration unless it traces in all crosses direct to imported stock; thus cutting out all grade animals hitherto recorded. Even this did not satisfy them, for they soon started the British-American Herd Book with the same standard, and defending their action with the argument that as there were so many tainted pedigrees in the Canada Shorthorn Herd Book, American buyers would never gain confidence in it. At the end of 1885, this new association had published three volumes, and had a fourth in manuscript; a fast increasing membership and at the expense of the old association, showed that the change was needed. In other words, it was discovered that pure-bred bulls and American bred cows could never make pure shorthorns of the produce.

Unfortunately for the British-American people they took the American book as gospel, and used American numbers without examining the pedigrees. They even used Canadian cattle with American numbers, and, as a consequence, the boon was soon denounced.

The Council of Agriculture, finding that the other book was to be published, determined, and, I am sorry to say now, by my advice chiefly, to recede from the standard passed at London in September. On November 25th, 1880, the standard was amended so as to admit the progeny of females already recorded, having seven crosses.

My education then commenced; I found everybody rushing to the new book that possibly could, convincing me at last, that the higher the standard was the better for the book. We had the unpleasant experience of seeing the breeders desert us for what has turned out to be a no more reliable book.

Fortunately at this juncture, and owing mainly to the exertions of Mr. Thomas Shaw, of the Live Stock Journal, Hamilton, who waited on both institutions—and I can tell you that his views were not cordially received by at least one of them—the great fact of amalgamation was carried out. And now in our Dominion Shorthorn Herd Book, we have a herd book with the highest standard in the world. The first volume is now being published and will soon be issued to breeders all over the Dominion. Much dissatisfaction is naturally felt amongst those whose cattle have been rejected, so much that a strong attempt is to be made at the next annual meeting to have the standard once more lowered. Such a course as this would be sure to inspire distrust in the minds of breeders, and would besides bring ridicule upon the Association and its members.

It is very hard, I have no doubt, to accept with good grace the statement that your cattle, which heretofore you have never had any trouble in recording, are neither eligible now, nor ever will be, notwithstanding many of the crosses are of that old Kentucky Woods blood, handed down through the thirty-two volumes of the American Herd Book. All this is hard to bear, but is it not far better to suffer losses now, in order that this tainted blood may be got rid of, and have cattle in the future that are Cæsar's tribe—above suspicion.

Many of the rejected cattle are in looks superior to some that are accepted, but this is not the fault of the pedigree, but of the breeder's using no science in selecting nor prudence in feeding his stock.

ELECTION OF OFFICERS.

The President then called upon the Committee on nominations for their report, at the same time expressing his gratitude for the manner in which he had been treated during the last four years. He had always, he said, been proud of the position he held as the representative of an industry second to none in the province of Ontario, and would in the future, as he had always done in the past, lend every effort in his power toward the advancement of the aims of the Association.

The report of the nominating committee was then submitted.

Your Committee on Nominations beg leave to submit their report as follows:

President	D. M. Macpherson, Lancaster.
1st Vice-President	D. Vandewater, Chatterton.
2nd Vice-President	James Bissell, Algonquin.
Directors—Division No. 1	Wm. Eager, South Mountain.
Division No. 2	Edward Kidd, North Grove.
Division No. 3	F. H. McCrae, Brockville.
Division No. 4	James Haggarty, W. Huntingdon.
Division No. 5	Platt Hinman, Grafton.
Division No. 6	Henry Wade, Toronto.
Auditors—James Hamilton	Foxboro.
N. H. Fields	Lyn.

All of which is respectfully submitted.

D. M. MACPHERSON,
D. VANDEWATER,
JAMES BISSELL, } Committee.

On motion of Mr. H. Ashley, seconded by Mr. M. K. Everett, the report was received and adopted.

On motion of Mr. H. Bissell, seconded by Mr. F. H. McCrae, the thanks of the Association were tendered to the retiring President for the zealous and efficient manner in which he had discharged the duties of his position.

A vote of thanks was tendered also to Mr. Ira Morgan, the retiring chairman of the finance committee.

The President elect, Mr. D. M. Macpherson, then took the chair, and said: In assuming my place in the honourable position to which you have elected me as President of this important Association, I take the privilege of addressing a few words to you. I feel, gentlemen, that the responsibilities of this position are many and important. I am conscious that the shaping of the destiny of the dairy interests of this country, which are now assuming a leading position among our agricultural pursuits, will depend largely upon influences extending from this Association, and I am fully alive to the importance of the duties devolving upon me. But at the same time I feel that with the able support of my fellow officers and the members of this Association I have nothing to fear in the future, though I believe we have a very large amount of work to accomplish, a great number of improvements to effect and defects to remedy, in order to raise the standard of our produce to the highest point of excellence. The nature of these defects and the line of improvements you have already learned from the remarks of Professor Robertson. There is no doubt that the inferior quality of the poorer class of goods manufactured detracts materially from the value of the higher quality, and that it is necessary to raise the entire dairy product of our country to a higher general standard; or to secure a system of selection by which inferior butter and cheese can be properly graded and each grade sold at its own value according to its quality, which would no doubt conduce greatly to the profit of all concerned. I feel, gentlemen, that if we can so raise the standard of the cheese made in this country, it will enhance its value to an extent which may eventually amount to millions of dollars. I am afraid there is too much selfishness displayed in the actions of many of our leading dairymen. Many of those who themselves produce the best quality of cheese are not willing enough to lend their aid in raising the standard of the surrounding factories and creameries, losing sight of the fact that the inferior quality of the goods sent out from these factories reduces the ultimate value of their own. But we must not rest content even with raising the poorer grades to the highest standard of excellence; we must

endeavour to further improve the quality of the best article as it is now produced. I feel that in the future we must reduce our business to a more systematic basis if we would accomplish the greatest possible good. I believe, also, that we are not receiving from the Provincial Government as much assistance as we ought in the way of sending out instructors to our dairymen, and think that a delegation selected from this Association would have no difficulty in securing from the proper authorities at Toronto a further grant of from $1,000 to perhaps $1,500, which could be well spent in the employment of more instructors. It is a fact, admitted by all, that the present instructors have too much ground to travel over, and that for that reason a large proportion of the money we are at present spending is practically lost. If we had a larger number of instructors who could spend a longer period of the season, or the whole season through, we would realize more benefit from the amount we are now expending. I am also of opinion that it would be well to make these instructors subject to the control of the professor at Guelph Agricultural College. At the head of its dairy department is a gentleman in every way worthy of our respect and esteem, a man of whom we may be proud, and whose abilities have been so eminently displayed at the present meeting. He does not confine himself to theoretical ideas, but goes further than that and puts his ideas into practice. If the instructors were made subordinate to the professor in Guelph as I suggest, I have no doubt it could be arranged for him to visit them or for them in a body to attend at the College for the purpose of receiving instruction from him, and learning the most improved methods of working. We all know that we have many different varieties of both cheese and butter produced in this country, that we have no one prominent system laid before our manufacturers in such a way as to enable them to produce a uniform article. It is an admitted fact that even a poor system is better than none, for you can improve the poor system, while where none exists improvement is almost impossible. If my suggestion were acted on, the business would be systematized by the professor at Guelph imparting instruction to the instructors or inspectors, who in turn would convey that knowledge to the makers in each individual factory. I think if we go to work in this way it will be of lasting benefit to this industry which we are unitedly striving to improve in Canada. Gentlemen, I ask your hearty co-operation in making these meetings a lasting success. Without your united effort and encouragement, without your combined intellect, it is impossible to realize the full benefit that should accrue from them. I ask your hearty co-operation in the good work of going on and in the future making this Association even a greater and more enduring success than it has been in the past. (Applause).

TREASURER'S REPORT.

Mr. P. R. Daly, treasurer, presented the following report, which on motion of Mr. Vandewater, seconded by Mr. Ashley, was received and adopted:

P. R. Daly, treasurer, in Account with the Eastern Ontario Dairymen's Association.

RECEIPTS.

1886.		
Jan. 6.	—Balance from last account	$ 3 59
	Members' fees	114 00
May.	—Government grant	1,500 00
	Cash from James Witton, cheese instructor	78 00
	Cash from Howard Bissell, cheese instructor	50 00
		$1,745 59

DISBURSEMENTS.

1886.			
Jan. 6.—Annual Convention at Belleville—			
Staff of speakers	$140 35		
Cheese instructors	27 00		
Auditors	24 50		
Reporter	40 00		
Printing	34 97		
Other expenses at Convention	155 75		
			$422 57
Board Meeting at Guelph			148 10
H. Bissell, as instructor			300 00
Jas. Whitton, instructor			328 00
Secretary's salary, including postage and stationery			140 00
Treasurer's salary			25 00
Discount at bank			6 86
Postage and stationery			2 00
Sept. —Agricultural and Arts Association, prize money			100 00
Balance on hand			273 06
			$1,745 59

Audited and found correct.

J. S. HAMILTON, }
T. H. McCRAE, } Auditors.

January 7th, 1887.

Mr. Daly referred to the project of appointing additional instructors, the only difficulty in the way of which, he said, was the lack of sufficient funds. He was satisfied there was no point to which they should pay so much attention as securing efficient instructors in order to carry on the good missionary work so that it would reach every factory, and if possible the homes of dairymen and farmers. He thought the hint thrown out by the President pointed in the right direction; the Ontario Government could not better dispose of a portion of their surplus than in promoting one of the most important interests of the country. He was confident of the willingness of the Government to assist the Association whenever it could be shown to them that the increased grant would be used to advantage. He thought the Convention should not adjourn without appointing a good, efficient committee to place the matter in its proper light before the Provincial Government, and he felt sure, if this were done, that the money would be granted and most beneficial results attained.

Mr. Thos. McDonald, of Morrisburgh, then read the following paper on the butter and cheese-making interests of Canada:

BUTTER AND CHEESE-MAKING IN CANADA.

In the onward march of civilization towards progressive wealth, in every country, supplementary aids within the province of the legislature are frequently employed, to contribute to the well-being, happiness and contentment of the people, as well as to awaken a spirit of national enterprise, and promote the development of those resources for which the nation or country is particularly noted. In this respect, every nation endeavours to utilize the resources upon which material prosperity depends, and summon to its aid all means within reach to render the progress to national and individual wealth

accessible to every citizen, and within the reach of those whose habits of industry and thrift are especially marked by their diligence and care.

Canada is no exception to this rule. Her vast, and, I might say, almost boundless resources, already respond with some measure of profit to the developing hand of the artisan, the miner, the lumbermen, the agriculturist, the fisherman and last, but not least, the dairyman. Supplementary aids in many departments of our national industries have been wisely encouraged by our legislature, and the result is that both by private and public legislation, the formation of voluntary associations, the co-operation of individuals engaged in the same enterprise, the acceptance of the development of the internal resources of our country as the only reliable means for the extension of our trade, both inland and foreign, all point to the glowing future of our country as a nation of boundless progressive wealth.

Nations, as well as individuals, subsist on food. The industries of the nation are the food of the nation. And whichever industry distributes most uniformly through its several avenues of wealth the greatest amount of good to the greatest number must be accepted as the native industry of the nation; and it seems to me quite obvious when viewing it from a disinterested standpoint, contrasting the several industries of our country, taking fully into account the capital employed and the revenue produced, that the dairying interests of Canada stand pre-eminent above all others.

It is only when we glance at the length and breadth of our country, and view with pleasurable delight about two million milch cows grazing upon a broad extensive plain of rich fertile soil, comprising an area of seven million acres of pasturage, that we are at all enabled to form any just conception of the magnitude of the dairying interests of Canada, or the value of the sweet, rich, nutritious milk produced annually by those cows. It is then we look around for supplementary aid to enlarge this great natural fountain of milk, to utilize it as a national food, either as butter or cheese, and finally as an article of commerce to seek a market in other countries for our surplus at a price remunerative to the dairyman.

We naturally direct our attention to England as a consuming centre for our surplus butter and cheese, not because the British consumer gives us any preference over other countries, in consequence of our attachment to the crown, but simply because he can purchase both butter and cheese in Canada cheaper than he can purchase it elsewhere, and at much less cost than he can produce it himself. A comparison of the dairying in both countries, as well as the exports and imports, as based upon the best English and Canadian authority, will readily convince the most sceptical that butter and cheese are produced at a much less cost in Canada than in England, and therefore sought after by the British consumers in consequence of its cheapness, when compared with their own home make or the make of other countries.

The average English cow is valued, by the best English authority, at $100, and yields annually 4,500 pounds of milk. There were in 1885 three and a-half millions of milch cows in the United Kingdom, which gives a direct dairy capital of $350,000,000.

The yield of milk from the English dairy annually would therefore be 15,750,000,000, pounds, which, if made into cheese and sold at twelve cents per pound would net $189,000,000, or a profit of fifty-four per cent. on the direct capital employed.

By the last decennial census of Canada, we had one and three-quarter millions of milch cows. Assuming the increase for the last five years to be equal to the increase for the five years preceding the last census we would now have two million milch cows at an estimated value of $40 per head, which would show a direct dairy capital in Canada of $80,000,000. The annual yield from those cows, at an estimate of 4,000 pounds per head, per annum, which, to my mind, is a low estimate, would give 8,000,000,000 pounds of milk, and if converted into cheese on the basis of ten pounds of milk to one pound of cheese, would show 800,000,000 pounds of cheese, which, if sold at ten cents per pound, would show $80,000,000, or a net profit of 100 per cent.

From this calculation it is evident that the dairying interest of Canada is paramount to all other industries, yielding a larger revenue for the capital employed than any other

legitimate pursuit or enterprise. Even our banking institutions, with a combined capital of fifty and a half millions of dollars, and a combined rest of $16,000,000, only yield a net revenue of three and three-quarter millions to the stockholders, or about six per cent. of the capital employed. Our export of butter and cheese in 1885, after supplying all the requirements of our home market, was about ten millions, or nearly fifteen per cent. of the capital employed. In this comparison I have not taken into account the labour employed nor the cost of grazing and feeding in either country, but assuming them to be relatively proportional we would find the results to vary very little from the figures given.

If the importance of the dairying interests of Canada be an accepted fact, and its further development regarded with favor as a great wealth, distributing medium among the people of Canada, it is but reasonable that we, as sentient beings, should inquire as to the available facilities for expansion, and the best means of producing it.

We in Canada have one milch cow for every three souls, while in England they have one milch cow for every ten souls. It is therefore evident that England must import butter and cheese largely from other countries, as they cannot manufacture enough within themselves.

In 1883, England imported 201,566,848 pounds of cheese at an average cost of twelve cents per pound. In the same year, she imported 261,460,976 pounds of butter at an average cost of twenty-two and a-half cents per pound.

We will now place in a tabulated form the quantity she imported from Canada, and compare it with other countries; and you will see at a glance the insignificance of the trade with Canada when compared with that of other countries.

Britain's Imports in 1883.

—	Butter.	Value.	Cheese.	Value.
From Canada	8,106,447	1,705,817	58,041,387	6,451,870
From other countries	253,354,529	57,163,848	143,525,461	18,000,130
Total	261,460,976	58,869,665	201,566,848	24,452,000

This comparison fully proves the extent to which our dairying interests might be expanded without producing an over supply. In addition to the number of milch cows owned by Canada in 1883, we would require to have possessed 1,600,000 cows more to supply Britain with the butter she purchased from other countries, and about half a million more to supply Britain with the cheese she purchased from other countries in that year.

Those additional cows, if owned by Canadian dairymen, would have yielded a net revenue of $75,000,000 additional in that year.

Possessing as we do in Canada large areas of rich, fertile and prolific soil, abundance of pure, spring water, brooks, rivulets and waterways sufficiently numerous to prevent any contingency of scarcity; and still more, being cognizant of the fact that already the circumscribed areas of pasture and meadow land in England are growing gradually less, resulting in a proportional diminution of dairying in that country. It becomes more conclusive to my mind than ever, that a united Canada should speak as one people to the mother country. Speak through the legislature of Canada, in a manner to be understood, that it is the desire of her people that the Imperial Parliament should recognize the fact that the use of butterine and oleomargarine, as substitutes for butter in her country is materially affecting the progressive wealth of Canada; that it retards the further

development of the butter industry in Canada, clogs the wheels of commerce, and brings into daily use in England, from foreign countries, an article unfit for human food, to the detriment of the loyal colony of Canada.

Every industry in civilization suffers directly or indirectly from the use or the abuse of the butter substitutes, without in any way benefiting the consumer. In fact, the gratification of an appetite with an article of food made from substances nauseous to the taste in their abstract capacity, debases the human understanding, lowers the individual in his own estimation, and in a quarter of a century the nation that feeds her people on those butter substitutes, without any legislative restraint, will look in vain for that high standard of moral worth in man, so beautifully portrayed by Pope :—

"The bliss of man, could pride that blessing find,
Is not to act or think beyond mankind,
No powers of body or of soul to share,
But what his nature and his state can bear."

If those butter substitutes were removed from the English market or controlled by legislation the effects would be sensibly felt in every channel of trade, and Canada could confidently expand her dairying pursuits, relying on Britain for a market for her surplus production. But as long as a good quality of oleomargarine can be purchased in Liverpool or London at three cents per pound, it exercises directly a depressing influence on the value of all grades of butter, and indirectly on all grades of cheese, inasmuch as it tends to increase the make of English cheese, and thus shut out a portion of our make, which otherwise might sell at good full prices. Any movement inaugurated by this Association as a preliminary step to memorialize the Imperial Parliament, through our legislature, to institute, if need be, an international enquiry into the effects, special, general and particular, resulting from the unrestrained use of butter substitutes in England, would, I am sure, receive the united endorsation of the people of Canada, and receive a favourable consideration at the hands of Her Majesty's advisers.

Were we able to accomplish this end the quality of creamery butter which we are now producing in Canada, when sold fresh would soon supplant the Danish and other foreign butters, and instead of exporting $1,000,000 of butter, as was the case in 1883, our exports would soon stand at the head of the list, and our butter be recognized by the British consumer as a necessity.

I must differ from our worthy Professor as to the propriety of holding butter in cold storage, in Canada or elsewhere, waiting for a suitable market. The principle is one that does not commend itself to my mind. After an experience of twenty-two years in the butter business, I have come to the conclusion—and I believe the business community will endorse it—that untold millions have been lost to the people of Canada by holding their butter until it becomes stale, strong and unacceptable to the British consumer. Let us once remove from the English market the presence of French, Danish and German butterine, and all other substitutes for butter.

If this cannot be done by remonstrance or reasonable representations, let it be done through the medium of a stipulated treaty if need be; and we will have secured for Canada one of the greatest blessings of the land. No matter how advantageous may be the facilities for cold storage, still it should not be countenanced by butter-makers as a medium to speculation.

First of all make good, sweet, palatable butter, having due regard to cleanliness, water, salt and especially the surroundings of your milk and butter rooms. Then sell it while it is fresh, sweet and full of a rich, creamy flavour, and Canada will soon regain her butter trade with England, that has been gradually diminishing for years past. I strongly recommend the adoption of the Professor's views as to winter-dairying. It is certainly a matter that the people of Canada should not ignore. With proper care and attention a large quantity of our finest butters can be made from November to June, and during a season of the year that a probable scarcity is likely to exist in other countries. This would provide a means for disposing of the spring milk now put into fodder-cheese, to the detriment of the Canadian and other markets for the balance of the year. Were the

cheese-makers of Canada and United States to allow their factories to remain closed till the first day of June, it would raise the standard of intrinsic value of Canadian cheese at least twenty per cent. higher than we have realized for many years past. But the large quantities of fodder-cheese, usually thrown on the market as an article that must be got rid of, depresses and breaks the market; and shrewd cheese dealers stock themselves largely with those goods and as long as they are able to retail cheap cheese in England, made by Canada and the United States, there is no reasonable hope for much advancement in prices of June and other months, before this stock is exhausted.

I then say, with a united effort the people of Canada will impress England with the necessity of at least imposing a legislative restraint upon the use of butterine, and with prudence and care in our dairying industry, and skill in its management, both as to its manufacture and sale, I believe in a very few years the net revenue of the industry would show a return to Canada of $50,000,000 instead of $10,000,000, as to-day.

Prof. Robertson.—About how much Canadian summer butter is consumed in England before Christmas, according to your own judgment?

Mr. McDonald.—For the last four years the exportation of Canadian butter has gradually fallen off in consequence of the introduction of butterine in England. In the summer of 1884, however, the exports of butter to England were very large, the falling off only beginning in 1885 and 1886. At the present there seems a disposition on the part of English consumers to discontinue the use of butterine, and as soon as they do there will be a much better market and higher prices for our butter. As I suggested, all that is wanted is a hearty effort by Canada co-operating with those who are working for the abolition of butterine, and it will be found that our butter can be exported during the months of June, July and August just the same as at any other time.

Prof. Robertson.—That hardly covers the point raised by my question. According to my information Canadian butter is not consumed till December, no matter when shipped, and it then goes on to the table of the consumer in a very unsatisfactory condition. Now it is our business to see that our butter goes on the plate of the English consumer in the very best condition possible. I quite sympathize with all Mr. McDonald has said in regard to butterine, and have frequently had occasion when in England to discuss that subject from the English standpoint, endeavoring to convince them that the importation of these substitutes was injurious to Englishmen as well as hurtful to dairy interests all the world over. But you cannot argue the English out of buying butterine; it has got such a hold on the British public that I am very sorry to say it is there to stay, and for this reason. Butterine can be made far cheaper than we can supply butter even to the wholesale man, and it yields twice or three times the profit to the retailer that he can make on butter; and as long as it does that he will sell it every time. Now the force of public sentiment, and the legislation to which Mr. McDonald refers, may in the course of twenty years or so rid the country of these dishonest imitations; but at present we have to face the fact that it is there to compete with us. Now it does not begin to compete with us until the fall, it is not there in the summer time. I visited butterine factories in Holland, and I found that they made most of it from the month of October onward. It does not pay to make even it in the summer time, for it must be consumed when made; and if they find that it does not pay them in summer we can certainly learn a lesson from that. I would not recommend the holding of butter till it is off flavour; there has been untold money lost to Canadians from shipping butter in a stale state. But if this could be obviated by keeping the butter in such a condition that it would not go off flavour, and butter made in June could be placed on the market in December and January, we would have everything in our favour, carrying facilities and everything. Butter exposed for three days in an English shop suffers more in that time than it would in three months here kept at a temperature of about 40. I have always recommended and practiced selling cheese and butter when made, but this is a matter we have to look square in the face. I sold some butter last May—perhaps June—that was shipped to the old country, and I found that

same butter held in store cellars in Scotland in the month of October. Now if that butter had been held at Guelph it would have showed up at least two cents better in quality. These men buy the butter to keep it and make money, and if the flavour spoils our reputation is injured. I would rather that we should hold that butter here ourselves, and get the increased profit. At all events, even if we did not get that profit, we would maintain our reputation. I think if this matter were discussed in committee, Mr. McDonald's views and my own would be found to coincide. I favour helping the merchants and helping the farmers, and above all I favour anything that will bring money into the country and at the same time uphold the reputation of our dairy products.

Mr. DERBYSHIRE.—There is no doubt in my mind that the position taken by Mr. McDonald is the correct one. For the last twenty years we have been trying to make people sell butter when it is sweet and fresh and fit to eat, but we find to-day that half, perhaps three-quarters, of the butter in this very section is held until it is not fit for consumption. The reason I felt antagonistic to Professor Robertson's remarks on this subject this morning, was that he was tending to undo the work we have been trying to do here for the last twenty years in reference to this matter. The idea of holding butter coming from such a high authority will lead people to believe that we have been preaching to them only from motives of self interest; whereas our only object has been to place Canadian butter on the market in such condition that it would gain as high a reputation as our cheese has done. Of course we know that we have been completely wiped off the face of the earth as far as the butter market is concerned; we haven't a place to rest the sole of our foot; and this is all in consequence of what I have told you, that people persist in making butter in May or June and holding it till December, when it is not fit for use, and then bringing it into the market to sell. I remember when we used to handle from ten to fifteen thousand packages of butter here in a very few months, where to-day we do not handle as many hundred. The Americans have taken our market from us because they send their butter to Liverpool when it is in good condition and suits their customers' tastes. I hope that we will soon put a few first class creameries in operation, and see their produce sent to Liverpool while it is fresh and in the best condition, and so regain the position we have lost in butter exporting.

Prof. ROBERTSON.—I do not wish to be understood or reported as encouraging the holding of dairy butter by farmers or dairymen in any way. I was speaking this morning, and am this afternoon, entirely of holding June and July creamery butter. The practice of keeping dairy butter on the farm from June till December, and then bringing in the whole season's make at once, is of course detrimental to everybody; because the bad reputation makes it impossible for the merchant to pay a decent price and realize any profit. It is a practice deserving of all condemnation. But if these store-rooms were provided by merchants for their own use they could buy June butter in June and hold and ship it in the best condition. The object is to have it kept in the best manner and do away with this holding butter on farms, which is something I always have opposed, and am opposing now.

The following paper was then read by Thomas Shaw, Esq., of Hamilton, editor of the *Canadian Live Stock and Farm Journal:*

DAIRY BARNS.

No business can ever be carried on successfully where the outfit is incomplete. A farmer may locate upon a given piece of land with an outfit both inadequate and imperfect, and by sheer force of character, make a success of the undertaking, but the measure of his success will in no instance be equal to what it would have been, had this outfit been proportionate to his needs at the commencement of the work. It will have a very important bearing upon the measure of attainable success as to which of the factors of the outfit

may be lacking, as some of these may be requisites indispensable to success, and others of them may have a bearing upon this of comparatively little importance. A farmer may succeed fairly well in preparing a field for sowing with an ordinary plough and harrow, providing he has a suitable team, but if the latter were lacking he would utterly fail, and if inferior the measure of his success would be greatly hindered, even though his plough and harrow were of the very first order. In this instance it would be unwisdom on the part of the farmer to direct his effort to the securing of a first-class plough rather than a first-class team if either was to be inferior.

As with the outfit for the farmer, so it is with the outfit for the dairyman. If this outfit is incomplete with the latter, so will the degree of his success be incomplete, and in dairying as in farming there are essentials in this outfit that are indispensable, and others that are less important. It is therefore of the first importance that both dairymen's associations and dairymen, should determine at the earliest stages of their work what is of primary and secondary importance in reference to its prosecution, and bend their energies accordingly.

Great praise is due to the Dairymen's Associations, both of the east and of the west, for the work that they have done. In cheese-dairying they have turned the feet of clay into gold, so that it is no more the feet, but the head of this mighty material Canadian image, which all the world are fast learning to worship. It is now the great baobab whose shadow affords protection to the dairymen even of Britain, who are prone to ascertain our methods.

But while we say all honour to the men who have thus achieved, we cannot give them unqualified praise. The world has been furnished with but one instance of a perfect man, the greatest of all its wonders, but it has not been furnished with even one instance of a perfect association. While the associations, both of the east and west, have fastened their attention on the improvement of the handling of the milk, and the promotion of uniformity in this from the day that the milk is drawn, until in its perfected form it is sold to the foreign buyer, they have not, in our estimation, given due prominence to the obtaining of the raw material from which the product is made. They have deepened the canal from its middle to its outlet, so that ships of ocean can sail between its banks, while from its starting point to its centre, it is scarcely deep enough to float a steamboat of the lakes. It will be admitted on all sides that, in dairying as in farming, there is an interdependence in the several parts and processes of the work so close and vital, that the slightest imperfection in one part hinders success in the other, so that if the cheese or butter product be ever so complete in itself, if the raw material from which it is made is not forthcoming in paying quantities, the dairymen may spend their strength in vain, just as the miner does who in seeking gold obtains it, but not in paying quantities.

We take it then as a healthy omen, that while the cheese associations are paying none the less attention to the outcome of their interest, they are giving increased attention to the obtaining of the raw material in paying quantities, as evidenced in the papers asked, and given at the annual conventions of more recent years.

The processes of dairying may be divided into two parts: obtaining the raw material and the handling of the same. The first great requisite in the prosecution of the former, is a good, practical, common-sense, teachable man, a species of raw material not within the province of the association to provide. The second is the dairy calf, a factor more important even than the dairy cow. The third is the dairy cow. The fourth is the provision of suitable food and drink for the same, and the fifth is the securing of suitable shelter both summer and winter, furnishing a wide field for the energies of the association for long years to come.

The latter in its winter feature is the subject of our paper. The amount that is lost in one year to dairymen in Ontario, from the lack of proper provisions of this nature, would, we believe, more than pay the cost of the associations, both of the east and of the west, for the next fifty years, an assertion that we hope to establish before we close this paper.

All important as the provision of shelter is in summer, it dwindles into insignificance when compared with the importance of providing it in winter in this cold climate. A dairy cow that is kept in an open shed in a Canadian winter will, we believe, not pay her

keep, let her be ever so well fed. We regret exceedingly that no comparative test has been conducted in this way, so far as we are aware. What an important work for the Ontario Agricultural College, where it would matter not whether the cows so tested were Holstein or Jersey, and where there would be little danger of any one finding fault with the results. What a magnificent piece of information it would prove to the farmer, which told him how much it cost him to keep his cow warm each winter term with hay and bran, instead of doing it with wads of stone and mortar.

The advantages of a suitable dairy barn are many and important. A first one that we mention is a proper receptacle for a whole winter's supply of feed in one place. Where food has to be drawn from one barn to another in the winter time, where half-loads and upsets, deep snow and snow banks are the order of the day, the loss of time is grievous. The barn should be sufficiently capacious to hold not only enough of this, but to have it so deposited that it will be nearest to that place where it is to be fed, and this will hold equally true of bedding supplies, which should, if at all possible, be under cover as well as the feed. The aim should be to have both food and bedding go from above, which always has some advantages over keeping these supplies on the same plane, in the saving of labour.

A second advantage consists in giving a proper temperature to the dairy stock. In wooden buildings, unless they are lined, this cannot be obtained ; hence our preference for basements of stone, which, when properly ventilated, enable one to keep the temperature absolutely comfortable for both milkers and cattle. When the milking is done by the inmates of the house, humanity demands of us that we shall not allow our wives and daughters and maidens to shiver in the cold, while performing this necessary work, however much we allow our cows to suffer. Viewing stone basements in the line of durability, they are cheaper than wood protections, and if built mostly above ground, as they should be, do not induce a dampness that incommodes or injures.

A third advantage consists in having an unfailing water supply, whether this comes from cisterns, living springs or wells, and it should be so arranged that it would be spontaneous in its flow on the turning of a tap, whether this arrangement is brought about by wind-power or any other power, or through the simple force of gravitation, by the proper utilization of the waters of a spring. Dairy cows should in no case be required to go out of doors for water in the winter, and they should have it pure and in abundance when they want it, and without leaving the stall. As one accredited fact is worth a hundred simple assertions we give the fact here. We were informed by Mr. Chas. Lott, a dairyman of North Warren, Warren Co., Penn., U.S.A., that during the winter of 1883-4, his cows drank at a pond or stream from holes cut in the ice, and that they were necessitated to stand out an hour or two during the cleaning of the stables ; the following winter they drank at a trough where water was conducted from a living spring, and remained out but a few minutes at a time. The increase in the quantity of milk from the same number of cows, and almost identically the same cows, was something over fifty per cent., making it very apparent that earth or stone is a much cheaper factor for heating the water for dairy cows than hay or grain. The statement of Mr. Lott may seem extravagant, and possibly it is so, but we took him for a candid and honourable man. If those of this audience, if we have such, as may practice watering by the old time honoured ice hole system, will but be persuaded to experiment in the direction indicated for themselves, we are quite sure that we will be abundantly repaid for the time spent in attending this annual convention.

A fourth advantage consists in having a floor of material and construction that will economize bedding, reduce foul odours to a minimum, keep the cows almost absolutely free from soiling by their own excrement, that saves all the liquid manure at the same time, and that can be cleaned or slushed as thoroughly as the floor of a kitchen at the will of the owner. Such a floor is a possibility, nay, it is within the province of any one to have it who cares to go to the expense, and it is not extravagant when we consider its durability. The material will be Portland cement, that is the top coat, resting on a thick layer of water-lime interlacing on its under surface a ground-work of gravel or broken stones. The stall floor must be even with an abrupt stone drop or a little higher, and the passage in the rear must incline towards the drop. The liquid voided thus remains near the drop, and a little cut bedding dusted along it twice a day licks it up clean, so that there is no waste. Where there is a suitable arrangement of water pipes within, slushing

the floor may be done at any time, the waste wate. escaping at the door where the stalls run across the building. Here we speak from our own experience. To each of us who can thus speak it is the most satisfying class of evidence.

The good Professor Roberts, of Cornell University, New York, stated to this association, when assembled last year in Belleville, that he did not favour concrete floors in dairy barns, on the ground that they were cold. Since that time we have satisfied ourselves, that where an average supply of bedding is provided, this will not be a serious objection to them. They may be, and doubtless are, less warm than wooden floors without bedding, but no dairyman should think of keeping his cow lying upon an unlittered floor of wood, though absolutely clean. The straw used as bedding is not a good conductor of cold, and therefore hinders any evil consequences that might be feared from this source.

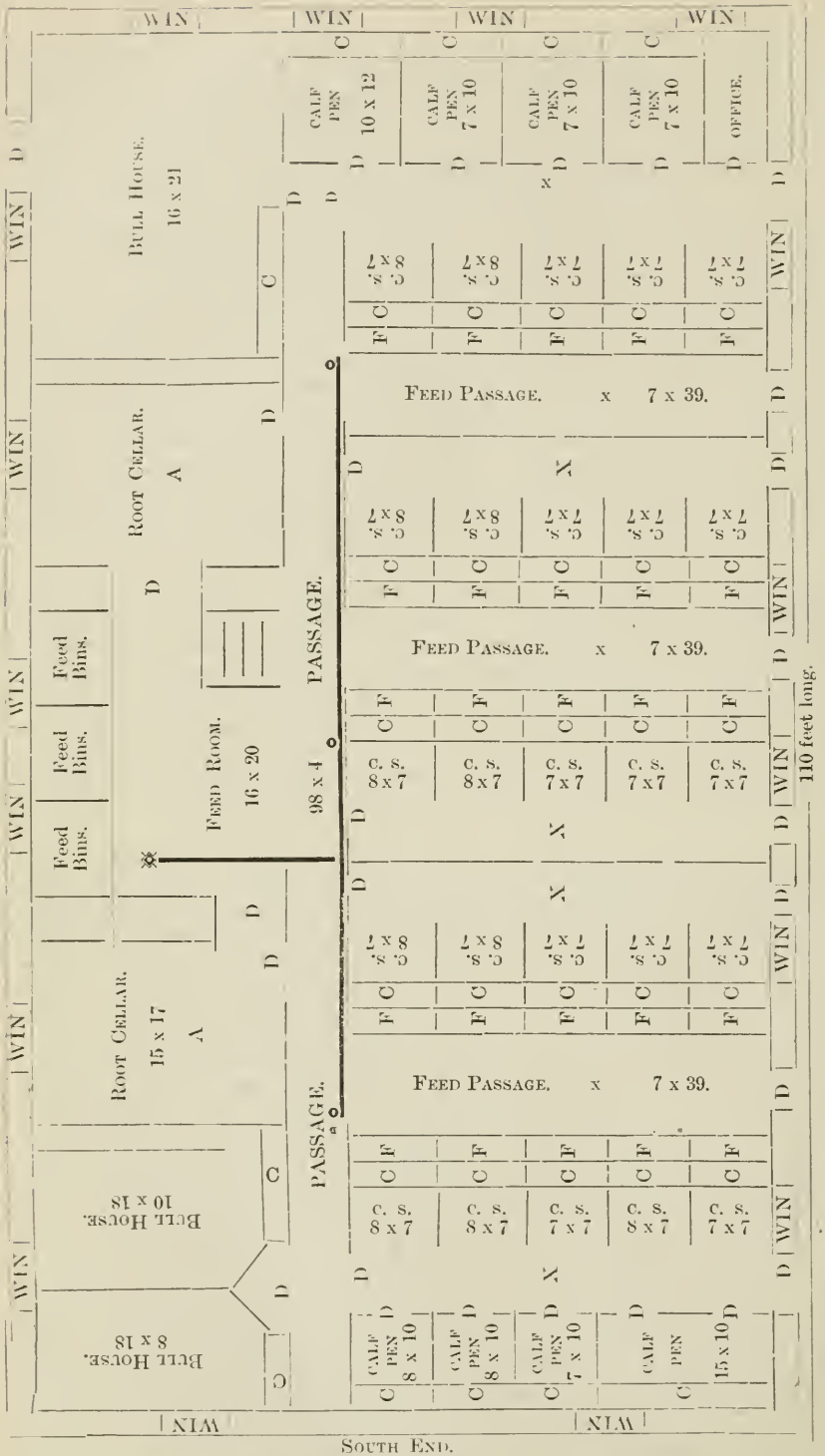
A fifth advantage enables the dairyman to reduce winter labour of attendance to a minimum, and thereby effects a very great saving. This saving may be made to amount to 100 per cent. for attendance, of course not including milking. And, here again, we speak from personal experience, one man now doing the work which formerly required two. True, our cattle are not, strictly speaking, dairy stock, but they require on the whole more attendance than is absolutely necessary to give dairy cattle, unless in the item of milking. With a building properly constructed, one hand will suffice for attendance for 100 head of cattle, and this attendance comprises every detail of providing food, water and cleaning the stables, including the grinding of the feed, where this is done by wind power. Where the fodder is all chopped, some additional help would require to be given.

A sixth and last advantage that we shall name here is this : that it enables dairymen to prosecute their business successfully in winter, the season of the year when butter dairying pays the best. In the summer season the price for home-made butter scarcely pays for handling the milk, while in the winter season, when there are proper facilities for making it, it pays well. Then just as surely as attention to the dairy calf is more important in the end than attention to the dairy cow, attention to the dairy barn is of prior importance to attention to the dairy market. Indeed, if our butter is to be exported in large quantities, it must be made in those months when its properties are such that it will be likely to keep best. These are without doubt the winter and spring months.

In the erection of a dairy barn the aim should be to comprise all these and other advantages in their most perfected form, whatever the variations may be, either in general outline or details of plan. To give plans of different forms of dairy barns in this paper, with details of construction, would unduly swell its limits. We have thought it better to give the plan of basement and ground floor, along with a sketch of the building itself, which we consider a good model of a dairy barn, leaving it to those who may deem it worth while to examine those plans to draw their own conclusions, and to carry away each for himself anything he may deem worthy of imitation. [See pp. 186-8.]

The plan most to our mind, and we have visited a large number of barns during the last three years, comprising the larger number of the best ones of our province, is, you will pardon us for saying it, that of a barn built upon our own farm at "Riverside" last summer. The plans and sketch referred to we now present to the dairymen of Canada, and if therefrom one single useful idea is obtained by the lowliest of them, we shall be more than repaid for the labour and trouble of preparing them. This barn was built not for dairy purposes, but to provide a suitable home for shorthorn cattle, although we fail to see why, with a few modifications which we shall mention, it should not serve equally well for dairy purposes.

This barn is 110 feet long and 60 feet broad, the outside post being 20 feet in length. It has a hip roof, from the centre of which rises a 16-foot wheel-geared windmill, constructed by the Ontario Pump Co., of Toronto, which grinds the grain, chaffs the fodder, and pumps the water. The windows admit a sufficiency of light, and as they swing, along with the end gables, admit plenty of air in summer. The water-tank 8x10 feet, circular in construction, is placed above the chaffing room, surrounded at present (Jan. 7th) with straw only, and has thus far given no indications of freezing. The only boxing and packing of pipes required is from the tank to the basement. A rack-lifter

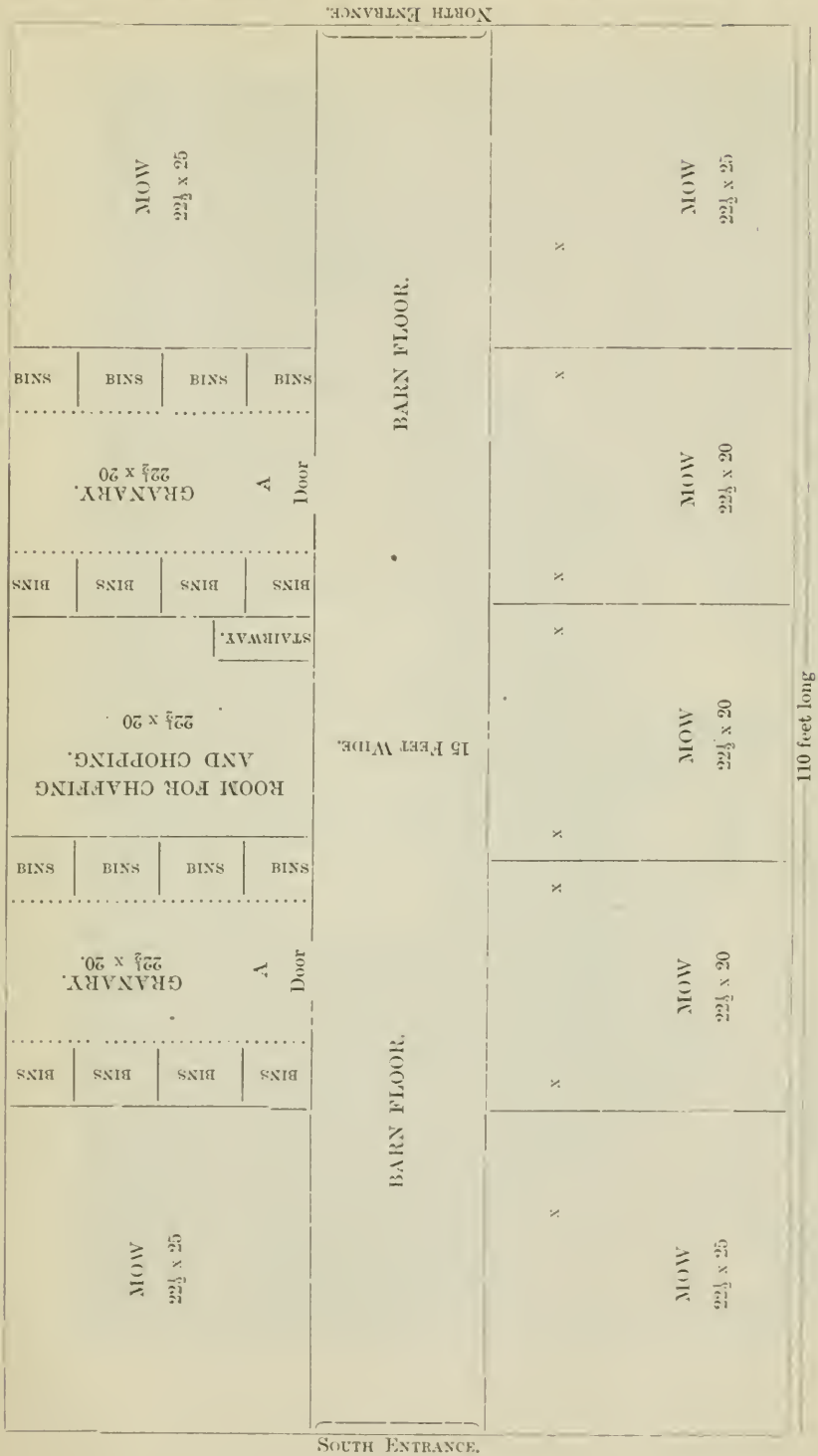


PLAN OF BASEMENT.

A—Root chute above.
Black line—Water pipe just under ceiling.
C—Manger.

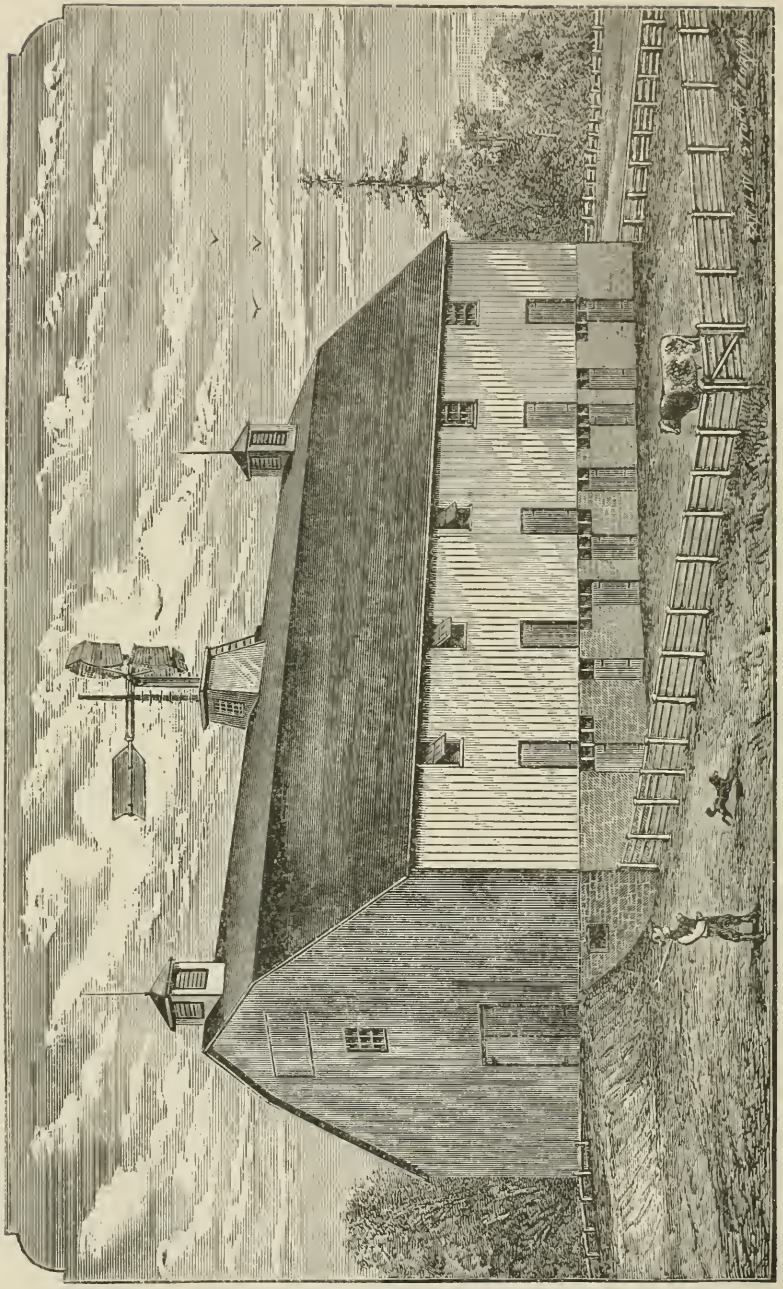
C. S.—Cow stall.
D—Door.
F—Water trough.

O—Tap with hose attached.
WIN—Window.
X—Feed chute.



GROUND PLAN.

A—Turnip chutes, X—Feed and bedding chutes,



NEW BARN AT RIVERSIDE.

movable on a track (as the building is of the end-drive construction) is used for handling sheaves. It was built by McPherson Bros., St. Anns, Ont., and works well; a hay fork will also be put in. The hay is all put in on one side and the grain on the other, reserving the end mow in the rear as the first receptacle for straw in threshing, thus keeping it all inside. We do not know that we would make any changes in the upper part in case of building again, unless in the matter of ventilation from the cellar. We would have more box ventilators; as at present arranged these come out under the eaves.

In the basement we would rearrange the division of the stalls and increase the number of ranges where the calf pens were not wanted, which would give eight of them at least or ten, if one was content with narrower passages behind the cattle. Ten of these ranges would hold 100 head, which would still leave the box stalls, now kept for bulls, to be utilized in keeping calves or mangolds as might be desired, or even additional cows. But it must be borne in mind that in constructing a barn on this plan there is a most intimate relation between the arrangement of the divisions of the basement and that of the ground floor. In the plan we have submitted, and it is one of its very best features, every upright piece of timber used both in the division of the ranges and of the stalls, forms a support for the ground floor with the immense pressure to which it is subjected. These uprights stand upon dwarf walls of stone laid in mortar, which gives a solidity to the building, which it is very desirable to obtain. In this plan it will be observed the box stalls at the two ends are for calves suckled by cows which are supposed to be kept in stalls across the passage. Strong bars glide from the former to the upright of the stall partition, which, when not in use, are slid back along the box stall partitions. The feed-room, being in the centre of one side, and directly under where the feed is cut above, brings the latter to the most convenient place on the whole for distributing. From the tank the water runs by pipes along the passage under the ground floor, and then by ducts into covered troughs in front of the cattle. These reach over the mangers and drink in an opening made by the drawing up of a self-supporting slide. The cover of the troughs is also the slide into the feed-box of manger, the racks for uncut fodder being above the drinking aperture. The troughs may be slushed at will for cleansing purposes. At the end of rack adjoining the wall and underneath is a duct covered with a grate and leading into a four-inch sewer pipe laid under the floor and conducted along one side of the building to a suitable place of discharge outside.

The well in this case is drilled deep in the rock to an endless supply of pure water, and is situated in the feed-room. Three double taps are at the base of as many of the ducts to afford opportunity of drawing water in pails at convenient places for the box stalls. A short hose with a sprinkler may be attached to the tap in the feed-room for damping the feed when desired, and a longer one to any of the taps for slushing the floors as may be desired.

The floor is concrete. By that we mean about four inches of broken stones below, on which is laid three inches of Thorold waterlime, and above the whole three-fourths of an inch of Portland cement. In the box-stalls is depressed about three inches. Behind the cattle a straight ledge of quarried stones is laid which forms a perpendicular drop six inches in height. The floor of the stall is a trifle more elevated than the ledge and the floor of the passage behind the animals inclines a little towards it, thus keeping the main part of the passage perfectly dry. It forms a beautifully hard, smooth and solid floor, and when kept dry is not slippery. If inconvenience arises from this source which we do not expect, it may be corrugated when being laid, but this will detract very much from the ease with which it could be cleaned. Such a floor when properly made does not decay. It gives no trouble by way of offensive odours and will only require to be laid once in a lifetime.

In a country where the thermometer rules so low as it does in Ontario during the winter months it is unaccountable that provision so inadequate has been made for the protection of stock, and the eastern portions with their better facilities for building, owing to their nearer location to the unexhausted lumber centres and the greater abundance of the stones, have been more remiss in this respect than the people of the west. In both sections we have met with farmers who, with a good deal of positiveness, have told us that their open sheds kept their cattle more hardy than those made frost-proof and

therefore they preferred that even the cows should occupy them. Well hardihood in stock is a desirable quality, but if it has to be purchased at the enormous expense of large quantities of additional feed, which like a cancer devours all the profit, we do not want either the cattle or the feed. It is only a grim satisfaction at the best for the farmer to be able to say of his porcupine-like hair-set beast, leaving the yard in the spring time after having eaten off his head in the winter, in accosting his neighbour who turns out one well fleshed and glossy and that has given him an ample return for his keep, "My beast is hardier than yours." Experiments that are made apparently to show how much a beast can endure in the form of privation are not of great value. They are not likely to find a place in the Book of Chronicles of our experiments with cattle, but with those, alas, too numerously engaged in making them, will go down to an oblivion wrapped in the shades of eternal night. It is sufficient for dairymen to know that cows kept in winter in over ground basement barns are sufficiently hardy for practical purposes, and this has been demonstrated over and over again. While the benighted individuals who keep the "hardy" breed and in a "hardy" way rejoice in their possession, let us not grudge them their dear bought joy; let us see to it that those in our possession give us satisfactory returns with that end in view; if we have not suitable protection for them, let us get it. We need not erect costly structures but the basis of the ground compartment must be mortar and stone, no other material in the end will prove so cheap. The supplies of stone in eastern Ontario are superabundant. We have ourselves seen the cattle shiver in the yards protected only by wooden sheds, while stones were cumbering every field, idle horses standing in the stables, and strong sleds stored away in the implement house, and the owners smoking a good deal more than usual, without knowing why, and were grumbling loudly at the duration of the winter. There was abundance of superfluous wood in the cedar log fences to build two or three good dairy barns, and plenty more in the swamps, calling to the farmer every time that he passed "Use me in keeping your cattle warm."

A most convincing proof of the superiority of properly constructed basement barns is found in the fact that those who have once used them never go back to the old plan and style. If they were not superior in many ways we would find men saying so, and saying so on platforms and in the agricultural press. If they had proved a failure the intelligence of Ontario would long ago have found it out and while the old ones would be left to crumble in dilapidation new ones would cease to be built. The dearth of good dairy barns even in the poorest dairy sections has filled us with astonishment. How many really good ones have we in the province? Is the number above a score? And our astonishment increases when we reflect that dairying is the first of our agricultural interests.

The attention that dairymen have given to this department of their work, important as it is, is out of all proportion meagre to that which they have given other departments of it, so that while they relax no one energy in the line of handling their milk properly, let them from this day onward utilize to the utmost their stones and trees and springs and hidden reservoirs in the production of an increase of milk that will astonish them, without any additional outlay of feed.

The saving to us in fodder alone in our basement barn this winter will be at least one third; of this we are quite sure now, as the winter will soon be half gone. And when we speak thus we do not speak at random, but as the result of most anxious calculations, induced by the knowledge that we were on short supplies. Mr. Blue sets down the number of cows in Ontario as 746,897, and most of us have an approximate idea of the amount of food consumed by one of these in the winter season. Assume that not one-half of this number is properly housed in winter—surely an assumption that is safe. Multiply this number by one-third the cost of keeping a cow through the winter and we have a magnificent product, much beyond the cost of the three dairy associations to the province and people for the next fifty years. In this comparison we have not considered the increased dairy returns, nor the improved condition of the stock when they go abroad in spring time equipped for a good summer's campaign.

The "mighty millions yet to be" of increased revenue to accrue to this province from proper attention to the construction of dairy barns should impel dairymen to move in the line of improvement indicated in this paper. Especially when each one has so

close an interest in this accumulating pile. If dairymen have not suitable barns we say build them. We know very well what all this implies, but it should be done. It is not necessary that they be so expensive. Let those who can't do better put stone walls under their present buildings to make them warm, and those who can, build new ones, so soon as they can collect the materials.

Increased gains in the future should urge us to provide better dairy barns, saving our feeding and utilizing it better should prompt us to move in the same direction, so should the desire to prevent that greatest of all farm leakages the waste of manure. The great saving of time that will follow is a motive that should impel, and the voice of humanity calls to all dairymen saying "Build good Barns."

The PRESIDENT.—How did you handle this manure and food in the barn you have been speaking of?

Mr. SHAW.—It was all wheeled out with a wheelbarrow. I am aware that some of you will object to that, and say it is an old time process; and I suppose it is; but in building dairy barns if you build so that a horse can be led through the passages you lose a great deal of room, which is a very important thing. If you have a great deal of room with comparatively little accomodation it is much more expensive to provide that room in the first place, and you lose a good deal in that way.

Mr. LEWIS.—All wheeled out under cover?

Mr. SHAW.—Well, I am afraid some of you will come down on me after I have answered that. However, farming is somewhat peculiar in our section. During the last three years I have travelled over the greater part of Ontario, and have had opportunities of seeing almost all the different soils in it; and I have occasionally heard people talking about clay; but I only know of one place in Canada where there really is clay, and that is right in the vicinity of my farm. Now, I am in favour of getting this manure to the place where it is going to stay as soon as I possibly can, and one man wheels out this manure to a pile in the yard, and another, who works the team, draws it to the place where it is to be applied, and leaves it there in piles. As soon as the frost is out of the land in spring it is spread, and when the land is fit to plough we plough it under. I would not have any one regard that feature as something very difficult to get over. I suppose most of you will think the amount of labour involved in getting it out in that way is very great, but in the barn to which your attention is directed in this paper the number of cattle at present, young and old, is about eighty-five head. There is but one man attending to these cattle, and he does all the work, grinding the grain and chaff and most of the food. We, on some occasions, set another man to work chaffing the food, but with that exception the one man does the entire work, including cleaning the stables, and they are kept very nice and clean.

Mr. MCDOUGALL.—Are you in the habit of cutting food in the fall of the year?

Mr. SHAW.—In former years only a part; now we cut the larger portion of it, which of course makes a difference.

Mr. MCDONALD.—Did you find it economical to cut?

Mr. SHAW.—Yes; if you are feeding grain or meal I always consider it preferable to cut food and mix bran or meal with the food so cut. I think the laws of physiology make it perfectly clear that that is the proper way to do; because in that case rumination takes place with all the meal that is fed; whereas if it is fed direct it is not ruminated at all.

Mr. LEWIS.—I think when our friend Shaw makes another barn he will leave a place so that he can drive right through with his waggon or sleigh, and load up his manure and get it on that clay ground of his a good deal quicker than he does at present. That is the way I do with mine. I drive right through the stable and load up the manure, and when it goes off the waggon or sleigh it goes right on my clay ground. I find it is worth more the sooner it is applied.

Mr. Ashley.—Whether it is cultivated or not?

Mr. Lewis.—Yes, any time. There is only about one month I cannot use it. I like to apply the manure as soon as possible, first on the surface. My soil is quite a strong clay, but the manure will go down somewhat,—sometimes it gets down too low. And now, gentlemen, in regard to the comfort Mr. Shaw secures for his cattle: that can hardly be overlooked. When I have been going through this province, and have seen the discomfort to which some of you subject your dairy stock, I have wondered that you made any profit at all. Almost every man thinks that dairy cows need exercise, and will turn them out in the morning to get it. Well, the exercise that tells most on you is when they hook each other round the yard; and, if you take the trouble to notice, you will see that as soon as they get through that pastime they will stand at the place near the fence where there is most shelter from the wind and cold. Now, I always believed till this winter that a dairy cow needed exercise occasionally. I always used to let them out in pleasant weather. We did it always until this year in the month of December. We let our herd out one beautiful day for about two hours, and, as a result of that exercise, we lost ten quarts of milk. I think it was the next week, or the week after, there was another beautiful day, and not being fully convinced yet that exercise was not necessary, I let them out again. We lost another ten quarts of milk by the little exercise they enjoyed on that day. Since that I have come to the conclusion that a cow in good, comfortable, warm quarters, where neither cold nor wind reaches her, can get all the exercise she needs right in the stable. I use the stanchion, "the old barbarous stanchion," because we can keep them clean in that way. We keep our cows thoroughly clean, as clean as we do our horses, and they don't waste their food. You give a cow too much room, and she will only get herself filthy with droppings. Many cows find it necessary to step up and get a mouthful of food and then step back again and chew it, and they will make themselves filthy. I put in the "barbarous, rigid stanchion," as they call it, in order to keep my cows clean, and to prevent their wasting their food. We water them by turning on a faucet in the barn, the water being supplied from tile drains in the stiff clay soil above. It is not very cold and they get all the water they want. We have no hooking, no pumping water up out of an ice hole with a suction pump, but they just stand there like ladies and get all they want, without hindrance or fear of molestation from each other. It is a mere farce, this giving dairy cows winter exercise out of the barn, and if you give them good comfortable quarters they wont ask for it.

Professor Robertson then delivered an address on

CHEESE-MAKING.

He spoke as follows:—I have enjoyed the present convention very much indeed so far as my part as an auditor is concerned, but that enjoyment has been somewhat alloyed by the feeling that I have perhaps occupied too much of your time already. However, I am willing to talk for a short time on the subject of cheese-making, and shall have pleasure in afterwards answering, so far as my knowledge will allow, any question that may be asked of me.

I have recognized these conventions in past years as being most important factors in the process of improving the quality of our goods. The work of the cheese instructors has been a most important one, and that of the cheese-buyers still more so, though perhaps less generally recognized. Their advice to makers, and their reports of the qualities of goods supplied them on former occasions, are great levers in compelling the cheese-makers to seek as much information and knowledge as possible; and to diligently apply the same in their daily practice.

Now, while we have all these facts operating to improve the quality of our cheese, and while we have to-day been congratulating ourselves on its high quality and reputation, there is need of guarding against complacently contenting ourselves with that reputation,

instead of pushing on to a still higher plane of excellence. Many with whom I have talked have said "Well now, Canada has the best reputation of any cheese-producing country," and seemed quite content to rest on their laurels of 1886; instead of making effort in the direction of higher excellence.

The philosophy of cheese-making bears a great resemblance to that of bicycle riding; you must go right on or you will go right off—there is no alternative. The cheese-maker who is content to stand still will be left behind; progress is absolutely necessary if you would avoid retrogression. Taking that axiom as a basis, I find that I have two points to work from, the first of which is, that it is incumbent on every dairyman to increase the milk production per cow. That is a point which has been already touched upon to-day, but I would like to specify three or four ways in which it may be accomplished. The average production per cow in Ontario, according to the statistics of the Bureau of Industries, is 2,800 pounds. Now, while the production of that quantity of milk per cow may pay very well with cheese at twelve or thirteen cents per pound, it does not pay when cheese gets down to seven or eight cents, and, hence, as periods of depression are to be anticipated in dairying, in common with all other industries, it becomes the duty and interest of dairymen to increase the production of milk per cow without increasing the cost of production, and thus put themselves in a position to sell cheese at seven cents with as much profit as they now realize at eleven cents. It is quite impossible for the dairyman to force the price from seven to eleven cents, but it is within his power to force the production per cow to forty-five or forty-nine hundred pounds, and he should not be satisfied with less than forty-five hundred.

I am not speaking at random or hap-hazard in this matter. I was so convinced last winter from knowledge previously obtained, and from observations in getting milk from a large number of patrons, that with proper care the production of milk might be so increased as to largely augment profits, that I requested the Government to buy, or allow me to buy, twelve cows. The permission was given, and the twelve animals were purchased at a cattle fair, being selected solely with a view to their being good milkers, and with no special reference to breed.

You all know that farmers do not send their best cows to fairs and markets. I may say here that I object to the process of weeding out poor milkers by transferring them from one herd to another. This weeding out should be effected through the butcher's agency. There is no profit in this transferring, and the dairy interest in general suffers from it. But, as I said, these cows were bought in an open fair, and I had to take my chance. They were very decent animals, costing about $40 each, delivered on the cars at Guelph. Perhaps that was $5 more than any other man would have paid, for when it is known that a man is buying for the Government there seems to be a kind of combination to keep the price up.

Well, these cows yielded 3,240 pounds of milk each on the average in one week less than four months—common Canadian cows. Now, I attribute that much milking merely to proper food and care. There is no secret about the management. I do not wish to create the impression that I ignore the value of breed; but breeds for a dairy cow I recognize merely as being the possession by an animal of certain characteristics which enable it to economically and profitably transfer and convert food into milk.

If certain animals for a succession of generations have had that faculty, it is certainly more likely to be found in their progeny. If you procured the best strain of milking cows that could be had for money, and neglected to care for and feed them properly, in at least two generations you would have cows that rendered neither credit to their breeding, nor profit to their owner. The breed can only be conserved by noticing the conditions which first gave rise to its characteristics.

By improper treatment you will weaken the quality of milk from the Jersey, or lessen the supply yielded by the Holstein. If you have an animal with a certain capacity you must at least comply with the conditions that fixed it, and if this fair play were given all round, at least eighty per cent. of our common Canadian cows would be much more profitable than they are now. I think that we have in our cows the inherent power to profitably convert food into milk, if we only comply with the required conditions as to feeding and caring for them at all times of the year.

I have known farmers in the winter to feed their cows in the best possible way, but at the same time expose them to raw, biting winds, that blew through their barns, till, as one of our friends described it to you, "the very bristles on their backs stood up," and they showed every indication of extreme discomfort.

That kind of treatment tends to make an animal consume more food to keep itself warm than it would otherwise do. Now, in summer feeding, a certain proportion of food goes to sustain life, and a certain proportion to produce milk. If, during the winter, you encourage the animal to consume a larger proportion of food to sustain life, that is continued during the summer to a greater extent than in the animal well maintained on the lowest possible quantity of food during the winter. The latter will produce milk from a larger proportion of its food in summer. Therefore warm dairy barns are profitable in that sense. I have not time to discuss this subject as fully as I would like, for there is a great deal in spring feeding to increase milk production. When a cow has been fed very sparingly till the milking season begins, the food should be gradually increased for ten days, until she receives the full complement of food she is capable of converting into milk. Every cow has not the same feeding capacity, but if the food contains the proper proportion of constituents the animal will take as much as is necessary and no more, though she will consume far more food than she needs if she gets too large a percentage of albuminoids or carbo-hydrates. I will cite you a table showing a suitable stable feed for cows. I find it to agree with the table of Professor Panton, at our College, who has given the subject much study, and with the practice of our best farmers. It is also the food fed by all dairy farmers in Denmark. Three pounds of bran, two pounds of oil or cotton seed-cake, five pounds of mixed grain, oats and barley, seven pounds of clover hay, and thirty pounds of mangels, with good straw.

This is the daily supply for 1,000 pound cows. Most Canadian farmers, during spring, feed their cows far more hay than that—timothy and not clover—but the tendency of timothy, especially when over ripe, is not to promote the production of milk; it will lessen rather than stimulate the supply. Sometimes too many roots are fed—as much as a bushel and a-half a day. The Danes feed only half a bushel, which they find quite enough to make a cow do her best.

Then, in regard to watering. While it is quite necessary that cows should have an abundance of water, it is well that in winter they should have it at a moderate temperature; not by means of that "time-honored ice hole," quoted by Mr. Shaw, but by the more modern and economical method of supplying it in the stable. I find the idea prevalent among dairymen, that if a cow drinks copiously of water she will give more milk, but of a poorer quality. My experience is, that if a cow is supplied with the right quantity of food of the proper character, she will not drink enough water to make her milk poor. Where you find too much water in milk it has not generally got there through the mouth of the cow.

Then, in regard to summer feeding, it is important that some supplementary food should be provided. During a portion of July and August the weather is so hot that the pasture fields become dried up for a week or two. Now, the loss from that is felt at once, but not the full extent of it. If the milk yield of the cows is allowed to shrink at that time on account of the absence of succulent food, it cannot be brought back, but if this supplementary food is provided they can be tided over that period, and will give more milk during September and October on the food which is then abundant. I carried on some experiments in that line at Guelph, the results of which you will find in my report, but of which I have only time now to say here that the supplementary food provided, in the shape of oats, vetches, or grain would yield a large profit. I arrived at that result in this way. I divided the cows into different lots, and reckoned that the extra production of milk by the cows that got supplementary food was equivalent to the value of that food. Estimating that way, I found the acres devoted to green food for our cows were quite profitably used. I think every farmer would find it profitable to sow an acre and a-half or two acres in this way, as by providing this supplementary food he would increase the production from each cow, and make more profit. I find also that this supplementary green food, instead of weakening the quality of the milk, (as, with every one who never

tested the matter, I formerly believed it did) made the milk richer. The milk, by actual analysis, contained a larger percentage of solids.

Another point which has been touched upon to-day is the salting of cows, upon which there is some diversity of opinion. With the view of gaining more knowledge in this connection I divided my twelve cows into lots. These had access to rock salt and ground salt at all times up to a certain period. Then all the salt was removed from the yards and fields in which they were pastured. Lots number one and two had no access whatever to salt for twelve days. Lots three and four had an abundant supply of ordinary granulated, barrel salt placed in their mangers; these had it twice a day. The immediate result was, that with the same pasture, water and care, lots number one and two fell off seventeen and a-half per cent. in their milk by the second day. After the lapse of twelve days lot number one was put back on salt, and number two got no salt. Number three got no salt, while number four got salt as before. Well, lot number one, after the salt was put in their mangers, gained some in quantity but not up to the standard they were at before. In the meantime, lot number three, which had not, while allowed free access to salt, suffered any diminution in the flow of milk, fell off considerably, which was conclusive evidence, to my mind, that the removal of the salt resulted in lessening the supply of milk. But that is not all. I thought I would investigate the condition of the milk, and in both cases where they had been deprived of salt I found that their milk, under the same condition as to temperature, would turn sour about twenty-four hours sooner than that of the cows which had access to salt. The difference in the milk was quite perceptible in the taste, even to a person not an expert. I frequently had the milk placed together in two cans, and got persons who knew nothing of the experiments I was making to taste the two samples, and all declared that the milk of the cows that had had no salt tasted fermented, weak, or of the cow. It was very imperfect for cheese-making during the periods while salt was withheld.

I had contended—it was purely theory—that rock salt alone was not enough for a cow, that she would be benefited by a larger quantity than could be licked from a lump of rock salt. During the progress of the experiments I took occasion to ascertain by actual weight the amount of salt consumed by the cows that had free and constant access to it, and found that it averaged four ounces per cow each day. A cow that had not had any for a week would take more than that. When the three cows had been kept without salt for twelve days, and were again about to be allowed access to it, I told the student in charge of them to put plenty of salt in their mangers. He put in only one pound each and they licked it up at once. Now, the effect of this was injurious; it made their milk taste quite salty. It is believed by many that free access to salt at all times is injurious but I believe it is not so, because they then do not take too much of it. The reason these cows sustained injury was in that they had been kept without salt, and then when supplied with it had taken too much. Therefore, I say, let cows have free access to granulated salt every day—not rock salt—and they will give more and better milk.

I now pass to the treatment of the cow necessary to increase the yield of milk. If she be roughly handled or frightened in any way the milk flow will be reduced then and afterwards, for the derangement of the glands which secrete the milk, cannot be easily rectified. I quite agree with all that has been said by our honourable friend Mr. Lewis, in regard to exercise for dairy cows. In Denmark I found that the best herds got no exercise whatever outside their stalls, for eleven months in the year, being tied up all that time. Exercise in growing animals is quite a different thing; they require it to put up bone and muscle, but it is not necessary for the production of milk.

There is great necessity for farmers to have clean surroundings for their milk; if they are not scrupulously clean certain germs, which settle on the milk, do it great injury. There is another point I would like to touch upon, that is, that the reputation of our cheese will suffer from making it from skimmed or partially skimmed milk. I advise all Canadians to make full milk cheese even up to the very end of the season. "Evil communications corrupt good manners," and being so near the border I am afraid this evil practice may creep in from our neighbours in the States. During the season, too, there is a little danger of cheese being made from milk that is not all of the milk; I am afraid too many yield to the temptation to take "just a little" cream off the milk. I find

that many dairymen and cheese-makers encourage farmers to keep milk hot at night because the cream does not then rise so, and since it does not it will have little liability of being separated from the cheese in the making. That is to say, if the cream be once separated from the milk it will never be incorporated with it again. Now, I find that there is no difficulty in retaining all the cream in the cheese. The rising of the cream does no injury for cheese-making purposes. The only separation which is harmful is the separation of the cream into another vessel. If you will just bear in mind during spring and summer, a few of these remarks, I think you will find dairying more profitable.

We have also to consider, as the second part of our subject, how to improve the quality of our cheese. As I said in my opening remarks we have not yet attained perfection by any means. We have a great deal more to learn, and must be more ready to put in practice the knowledge already acquired. I think cheese-makers know quite sufficient already to enable them to make far better cheese than they do. There is too much of a feeling abroad among them to be content with anything that will do at all. Now, "the thing will do" is a very bad motto indeed to adopt in connection with dairying. The motto should be rather, "nothing will do that can be better done," and the effort should be to do everything in the best manner possible. If cheese-makers would make up their minds not to rest content until this was done every day, and to finish up every day's work, leaving nothing till to-morrow, it would be a great step in advance.

I must condemn the use of ordinary home-made rennet, for while one person using it may make as good cheese as with the prepared extract, four will make a poor article. Use rennet that can be depended on as to its strength from day to day, for although the cheese-maker himself may know when the home-made is in a fit state, and how to make use of it, he may not all times be there. The assistant may have to attend to it; and I find that in many factories they are not supposed to know anything about the strength of the rennet.

It is very important to mix the proper quantity of rennet with the milk and in the proper way. Therefore it is best to use rennet of a given strength which can be used by any one. In putting in the rennet it is well to dilute it and make it quite weak. In a concentrated condition the tendency is to form in clots, and the coagulation will be very irregular, one part being harder than another, which has a tendency to destroy the keeping properties of the cheese. Never put in less than a whole pailful of water with ten, fifteen or twenty ounces of rennet. I recommend the use of cold water, because hot water in barrels is seldom fit for use in milk; and the cold water is generally pure and clean. In regard to the quantity that is put in, it varies according to the season of the year and the quality of the milk. If the milk be over-ripe, or at all acid in condition, I would recommend the cheese-maker to use more extract, for the purpose of coagulating the milk sooner, and getting the action of the rennet ahead of the action of the acid. You will find that a great help in getting the cheese well made.

A Member.—Would you cut the curd hard or soft when it is over-acid?

Prof. Robertson.—I should prefer to cut it on the soft side. I have made some experiments in that direction this year, and I find that it does not make much difference when the milk is pure, but cutting the curd on the soft side is somewhat safer, and yields as good results. If it be left until too hard, and the milk is at all acid, there is danger of difficulty in separating the whey without excessive stirring. No fixed time can be given for coagulation save by taking into consideration the condition of the milk. In regard to coagulation, apart from the time altogether, I think if the rennet were always diluted like this the coagulation would be so much more thorough that less loss in the whey would be sustained. The cutting of the curd is something that cannot well be dogmatized upon—as to the size of the pieces. It is quite possible to cut really fine, and then, by the most careful treatment afterwards, to get very fine cheese; and it is possible to cut really coarse if the curd is sweet enough to allow of handling slowly afterwards, so the whey can be completely expelled. If the milk is good I would favour cutting coarse rather than fine. I find it very much preferable to cut the curd horizontally first instead of perpendicularly. If the perpendicular knife is used first in cutting the curd it is quite impossible to have every piece cut just as fine as the distance between the blades of the

knife; then when the horizontal knife passes these are pushed before it. If the horizontal knife is used first, every part is cut into slices about a quarter of an inch thick. Using the horizontal knife first I find has this effect, that the whey separates into layers, and keeps one layer from clinging to another when the curd is soft. Last year in making cheese in the Dominion factory the cheese-maker used the perpendicular knife first, and I used the other first on purpose to test this. I found that all through the making the curd from the vat where the horizontal knife was used first, had far less tendency to form in lumps, or to mat together afterwards. There is a peculiar thin rind—I use the word in a qualified sense—formed on each small surface of curd, a formation not of rind but contracted cells, contracted on the surface around each piece. Well, now, when the curd lies cut the surface begins to contract a little bit, and these surfaces lying horizontally are far less liable to join on the other surfaces afterwards. The whey between the pieces helps to keep them separate.

In regard to stirring, too much care cannot be exercised. Rough stirring will not merely destroy a portion of the curd, and send it off in the whey, but it will destroy the structure of the curd to a certain extent by the jarring, though the shape is not changed. I have found also that rough handling loses a great deal of fat. By inspection under a microscope of a great many samples from different vats, I found globules of fat in the whey, as numerous in the whey as you see them on that paper (illustrating). Now, by gentle handling more perfect coagulation is secured. The rennet's globules are so small that over a thousand will lie on an inch, and the more evenly you can distribute these through the milk the more perfect will be the coagulation; you should stir the milk for a good while to get these mixed with it thoroughly. It is quite impossible to use too much care in stirring either in the earlier or later stage; of course, the injury is not so great when the curd becomes firmer.

In regard to heating I find it desirable to use water instead of dry steam, that is, hot water under the pans instead of steam only. I always find danger of part of the curd being scalded. If the tin pan be heated to say 250° or over by the steam striking it, then the portion of curd which touches the tin abstracts the heat from the tin itself and becomes nearly the temperature of the tin. Whenever the curd is heated to 150° it affects the keeping properties of the cheese; I find that wherever that portion of the curd happens to light, the cheese will certainly be poorer. The hot water need never be over 120, and does not scorch the curd at all, and I would advise you all to have your tins in order in this way this spring. The heating temperature might perhaps be safely fixed at 98°; it is not desirable to exceed that temperature, but it is generally well to have it up to that. Then it is a very important part of the process to ascertain the precise condition of the curd before the whey is removed. In regard to this matter, there is a great deal of ambiguity in the instructions, and looseness of ideas prevalent among cheese-makers. My idea of the matter is, that each portion of the curd should contain just so much water before the acid begins to change its constituents, and no more. If there be too much moisture in the curd when this acid change is about to commence the conditions should be made such as to favour the removal of this moisture. Now, whenever the curd will show hairs on the iron, that is an indication that the acid development is about to begin. If the curd be left floating in the whey, the outside pressure of the whey keeps it from freeing itself of the moisture. If you drop a sponge into the water it becomes expanded and stays expanded, but if you lift it out the action of gravitation frees the water from it. In that way you understand that by the removal of the curd from the whey the power of gravitation helps to force the moisture out of it. If you can have curd fully cooked before the acid process begins, it is not so important to have the whey draw sweet, although important to some extent, but if not cooked fully there would be too much moisture then in each piece, and it is imperative to have the whey drawn to bring about the best conditions favourable to speedy separation. Then the agitation of the curd in these particles helps to bring about separation. In that way it is very desirable to have the curd removed from the whey, or the whey removed off the curd, before the acid begins to develop. It is imperative to maintain the temperature of your making-room; unless the proper temperature is maintained at this stage, too much moisture will be retained in the curd, and you will have a curd of brittle texture, tallowy body, and imperfect flavour; a

temperature of 90° should be kept up in the curd. I have found it desirable to cover up curds so as to keep them warm, in preference to stirring them too much. If the curd is stirred very much the difficulty is to keep the temperature right.

I am not a bit afraid of pin-holes; they are to me merely an effect and not the cause of what injures the quality of the cheese afterwards. Pin-holes are the result of a certain fermentation. We know that germs lodge in the milk given from the cow, also on the utensils in the factory, which multiply and thus cause ferments. As a consequence, a certain gas is generated, as in bread. Now, the cheese-maker's business is not to get this gas blown away by aeration—that has been the theory. The purpose should be to let these germs develop, if they must, and then to bring about such conditions in the curd as will kill them. Now, we find that these germs are generally killed by the generation of lactic acid, which also is used by doctors for the purpose of syringing the throats of diphtheria patients to destroy the germs of that disease, and there is a very close analogy between those diphtheria germs and the germs that cause pin-holes. This acid will kill those germs, and for that reason I would keep the curd warm. I have had curds as porous as sponges; yet I do not think any buyer in England found any porous cheese from that curd, because I effectually killed them, and their "skeletons" are very small and will not do much harm. I found that in a curd where the temperature was kept as high as 94°, three hours was the longest time required to kill these germs after acid commenced to form. By all means keep the temperature up, and you will make better cheese. I made a number of tests during the past season, one of which I will mention here. I had a whole vat full of milk mixed up and then put in three divisions. To these three divisions I had the same treatment applied, the same temperature maintained, the same extract used, and the same method of making, up to the the time of drawing the whey. One lot was tapped while the curd was perfectly sweet. The next lot of whey was removed when the curd showed acid to the extent of one-quarter inch hairs on the iron, and the last lot was left till all the acid that was desirable was developed. The cheese of which I am speaking is still in the cellar of the College at Guelph—the property of the Western Dairymen's Association. I found that the cheese from the curd tapped while perfectly sweet were very fine after three weeks, and that from the other division equally fine; that is, if buying the cheese for immediate consumption I would have paid the same price for the three lots. After a little longer time the cheese from the first lot was somewhat better than at the first inspection, and the cheese from the third lot, with all the acid in the whey, somewhat poorer than on the first inspection. I made an examination of them the other day before leaving Guelph, and found the cheese from the first lot sound and sweet, and almost perfect in flavour to this day. Those from the very same milk where the acid had developed were off flavour, discoloured and quite mushy in texture. That proves to me that while it is possible to make fine cheese to go into immediate consumption by developing acid in the whey, it is not easy to make cheese that will keep five months afterwards, unless the whey be drawn sweet, especially if this cheese be subjected to unsuitable conditions. I took particular pains to have this cheese hurried up in August and part of September in the ordinary curing-room, not sheltered in any way, and shipped down from the place they were made to Guelph, during the hot season. The grease was oozing through the boxes, the scale boards were quite glued on the cheese by the grease. No special care was taken of them, but they were subjected to the worst conditions in the curing-room and in the shipping, for the simple purpose of ascertaining whether cheese from curd that was tapped sweet, would show better than cheese from curd tapped sour.

I was much pleased by the remarks of the president looking towards securing more systematic instruction throughout the province. System is necessary in every kind of work, and better results will be attained by unskilful men working systematically than by superior men working in an irregular manner. I think dairy associations should work more systematically in regard to instruction and inspection. I think inspection is helpful in this respect; if there is any kind of inspection it will stimulate the cheese-maker to do his best to make fine cheese, better than if none existed. When a man knows that his work is to be reviewed by another, and his mistakes made known, he will usually

do his very best. For that reason I think the system of inspection should be regular and thorough. I am glad there has been some recognition of the value of the dairy department of the Agricultural College. I think that department should prove serviceable to the dairymen of this province. It is not my intention to occupy the position of dairy superintendent there more than three months longer; private reasons which I am not at present at liberty to explain will cause my removal in that time. I hope the dairy associations will make themselves helpful to that department, and they will find it of great service to them. Every business must have a head, and the head of this business in Ontario is legitimately at Guelph. I hope this Association, through their directors, will give their hearty co-operation and help to whomsoever is appointed by the Government to that position, and help him to make the dairy department of the Agricultural College what it is desirous of being, a help to the province. For the next three months I shall continue in my present position, and shall be delighted—as will my superior, Mr. Ross, to permit me—to give my assistance in holding a series of district conventions, during the months of February and March, at convenient centres to be appointed by the Board. If it were thought well to have a few district meetings for the benefit of the patrons also I should be pleased to attend them during those months, that is, meetings under the auspices of the directors of this Association; I believe in working through established agencies. The directors can spend their time and money to some little advantage, by planning this campaign on behalf of the dairy industry. The dairymen of western Ontario have said they never did such good work as when they planned a similar series of meetings last year. In regard to the governmental aid which has been spoken of—I am only giving my own views and experience—I have always found the Government ready and willing to give money to any association or body that is willing and able to spend it in promoting the public welfare. They hold the public money for the public good. If your deputation can show Mr. Ross that this money will be applied in such a manner as to be helpful to Ontario, they will likely get it; if not, they will be denied.

I have to say before concluding that the Ontario exhibit of honey at the Indian and Colonial Exhibition did great service to the province, more, perhaps, than any other department except the cheese and butter and apples.

One other point. Some of the cheese from the Brockville district sent to the Exhibition were boxed with such care that I had the pleasure of placing them in a very prominent position, and boasting of our very good boxes. I do not know who made those boxes, but whoever he was, he was a benefactor to his country, and I hope that every cheese-maker during the coming season will try to have his boxes equal to them. I was proud of them, and the Englishmen said they were just what they wanted.

Mr. M. K. Everetts, seconded by Mr. O. H. Fields, then moved that the following gentlemen be a deputation to wait upon the members of the Ontario Government for the purpose of requesting a further grant of money for the purposes of the Association:—The President, the ex-President, and Messrs. Wm. Eager, Harford Ashley, James Miller, F. H. McCrea and James Alexander.

Mr. Miller suggested that it would be well to make the application conjointly with a deputation of the Western Association.

Mr. Everetts was certain that the Secretary, Mr. Ashley, would lose no time in communicating the passage of the present resolution to the Western Association, who would co-operate in the matter.

The President stated that it was his intention to visit the Western Convention, and he would confer with them as to the best means of carrying out the matter. He had no doubt they would give their co-operation.

Mr. Vandewater thought it would be preferable not to name any specific amount of money.

The motion was carried and the meeting then adjourned till 10 a.m. Friday.

REPORT OF COMMITTEE ON UTENSILS.

Upon the opening of the Convention on Friday morning the following report was presented:

To the President and Directors of the Dairymen's Association of Eastern Ontario, held in Brockville January 5th, 6th and 7th, 1887:

We, your Committee, appointed to report on the exhibit of dairy utensils, beg leave to submit the following:—

1. A cheese-vat exhibited by P. W. Strong, of Brockville, meets with our approval, and we recommend it as a great improvement on the old style of vats for heating, convenience and durability. His receiving milk can we think the best made.

2. The cheese-press, also made by Mr. Strong, seems to be a great improvement on the old style, particularly the device for continuous pressure.

3. The cream-separator exhibited by F. Wilson, of Montreal, is one worthy of a trial by dairymen, and we think it superior to the old system of milk setting.

(Signed) HOWARD BISSELL, Brockville.
THOS. J. MILLER, Spencerville.
R. WHORRY, Iroquois.

On motion of Mr. D. Derbyshire, seconded by Mr. James Alexander, the report was received and adopted.

DISCUSSION ON PROFESSOR ROBERTSON'S ADDRESS.

The discussion of Prof. Robertson's address on cheese-making was then proceeded with.

Mr. H. Bissell.—I would like to ask Prof. Robertson a question in regard to salting. I am led by my experience to think that in the spring of the year less salt is required than in July, and that in the fall more is necessary; I believe many cheese are spoiled for the want of it at the latter season. I would also like his opinion in regard to maturing milk. I made some experiments in the fall of the year in maturing milk before adding rennet with very favourable results.

Prof. Robertson.—In taking up the question in regard to salt I will speak of it in two ways. There is a necessity for varying the quantity of salt according to the season of the year, and for two reasons. First, because the quality of the milk differs with the seasons, and secondly, because the destiny of the cheese is not the same at all times. The spring cheese would require less salt for keeping for a given length of time than the summer cheese would, and the spring cheese is not expected to be kept so long as cheese made in the summer; therefore spring cheese should be less salted than the summer make. There is a third aspect in which the use of salt is to be considered; that is the taste of the consumer in England, which is a factor in making a decision as to what amount of salt should be used. Apart from the preservative action of salt on cheese the taste of the consumer is to be studied. Now, I have found that the taste of the English public is for a cheese salted with from one pound and three-quarters to two pounds and three-quarters of salt per 1,000 lbs. of milk; the curd being in a firm, dry state. The action of salt is to preserve the body of cheese, whereby its flavour will be retained longer; therefore it is desirable to use salt both for its mechanical and chemical effects on the cheese. When salt is dissolved on curd its first effect is to abstract from it a certain amount of moisture, and then, by the consequent contraction of the curd, to expel more moisture. The first action of salt on curd is to dry it; indeed the theory of preservation by salt is held in many cases to be merely the abstraction of moisture and the closing of cells, as in fresh meat and other commodities. There is certainly truth in this, but it is not the whole truth for the cheese-maker. Natural decomposition in organic bodies,—flesh, milk, fish or bread,—is mostly carried on by the action of certain minute organisms in these commodities. This same process of change is exemplified by maggots in cheese,

only you can see the maggots destroying the cheese, whereas in the other cases, where decomposition is natural, it is mainly from the action of minuter organisms,—perhaps not the same in shape or the reproduction of themselves; but still living organisms,—too small to be seen by the naked eye. Now, salt retards the reproduction of most of these organisms which injure cheese, and makes the field unsuitable for their multiplication. Therefore such a quantity should be used as will check their reproduction and the consequent undesirable fermentation. Too much salt, however, should not be used, as it has a tendency, by the abstraction of moisture, and contraction, to make the cheese too dry in its body; and to produce a crumbly texture. It is possible to use just enough salt to obviate this danger and yet leave a sufficient quantity of moisture in the cheese. In the spring-time, if too much salt be used, the cheese will be far too dry, on account of the curd itself at that season being of a brittle texture; and above all things in cheese you should avoid hardness and dryness. Therefore, one pound and three-quarters is perhaps the outside limit for salting fodder cheese when the curd is dry, while in summer more may be used; perhaps two and a half pounds per 1000 lbs. milk on fairly dry curd. A cheese-maker must to a great extent use his own judgment as to quantities. I find some cheese that are very defective in body; in which the salt has been applied perhaps at the proper time, but the pressing of the cheese has been left till the action of the salt has rendered the process difficult. The first action of salt on the pieces of curd is to form a hard surface on the outside of each piece. In a very short time it penetrates further, and the whole piece becomes mellow and yielding. After a time the whole curd becomes very much firmer and harder, and if left in the vat or sink till the third stage the pieces are very unyielding. The curd should, therefore, be put in the hoops before this third stage is reached, which is probably in about three-quarters of an hour; thus a more uniform body will be secured. I find it best to put it in the hoops within fifteen minutes after the salt is applied. As soon as the salt is added to the curd the whey has a peculiarly unpalatable taste, and the sooner you can have that pressed out the richer will be the flavour of the curd. It is an important matter not to leave the curd too long. From fifteen to twenty minutes is sufficient time to give the curd a good airing. While I believe in good airing I have now less faith in it than I had a few years ago, my investigations having led me to pay less heed to it. I imagine the process of making cheese has not so much to do with air as it has with preventing the impurities in the air approaching the cheese. I think on account of the impurities of the air, I could make better keeping cheese in a room from which air was excluded than in the ordinary making-room where I could have all the air I wanted and more.

In Denmark they add salt by measure instead of by weight which I think you would find a good plan. I would like you for one week to make a comparative test of weighing and measuring salt. By measuring the same salting power is secured every day, but in weighing, if Monday is a very moist day, and Saturday a very dry one, or your salt is kept in the engine-room where the heat is very great, there will be a variation; you will put in a fourth more salt by weight when it is dry. The Danes find measuring very helpful, and I think you would do well to look into this matter for a week.

In regard to the maturing of milk, I am quite of opinion that it is desirable to do so by the application of heat and the lapse of time rather than by the addition of any acid to hasten the process, as there is a wide difference between the two methods. The best cheese is made from milk that is matured and ripened. I am not able to better define what I mean by that. I do not know how to express scientifically what is meant by milk being matured any more than to scientifically explain what is meant by the maturing in December of an apple which was probably ripe in August. I cannot explain what change went on in either the apple or the milk. But I know that certain changes in milk are produced only by the application of heat or the lapse of time. When I was making cheese from new milk twice a day I could tell by going through the factory shelves the cheese made on Monday mornings from mixed milk. They were quite different from the cheese made all the rest of the week. They were firmer in the body, better in texture and had a richer flavour. In fall cheese especially, ripening of the milk is necessary. I think cheese-makers would further their interests by getting their patrons to keep their milk warmer at home in October.

The odours of a farm house kitchen are certainly preferable to those of the average cheese-making rooms, and if the patrons had no other place it might be kept there at about the ordinary temperature of summer milk, which would save the cheese-maker some amount of trouble and result in his making finer cheese. I find in the Liverpool, London and New York markets much of the October cheese is distinguished at once by its feel, because it is soft and yielding, and has no firmness or fine body to it. October cheese made in Western Ontario, and some made in Eastern Ontario, has none of this softness of feeling, and if the milk has been properly matured, October and November cheese are worth just as much as that made in September. The main reason for that softness is the fact that the milk has been set before being ripened. However, do not add acid to mature milk.

There is one point more in reference to the salting. I said that the change from the first to second stage would perhaps take place in from fifteen to twenty minutes, and it was best the curd should be put in the hoops within three-quarters of an hour. I would not have cheese-makers think they must necessarily hoop the curd fifteen minutes after the salt is applied, but the second change begins then and the third at the three-quarters of an hour. The cheese-maker might take half an hour as a safe time beyond which never to leave his curd after the salt has been applied.

The President.—Professor Robertson, in speaking of the maturity of milk, said it was a process he could not scientifically describe. I may say that I believe the ripening of milk in the fall is the development in it of an amount of a certain class of acid, necessary for the formation and making of fine cheese. I think it is generally admitted that the class of acid which develops in milk is quite different from that which afterwards develops in the whey, and if that acid is not developed in the milk it must be subsequently produced in the curd. But it is then too late to do that, because another class of acid is developed which overcomes the influence of this assimilating acid—that is what I call it—a disintegrating acid. Now, this acid is what makes, what we call, sour cheese, but that which develops in its early stages in the milk has assimilating properties, and is the kind of acid needed to act in cheese as yeast does in the baker's bread. Hence we have to induce the development of that class of acid in the milk or curd for the purpose of bringing about certain changes necessary in attaining the best results. I think we have hitherto overlooked this important thing—these two classes of acids. One disintegrates the solids and fluids and the other assimilates. From 95 to 98 is the temperature at which this assimilating acid develops on the curd, while the other class—the disintegrating acid—develops at a lower temperature, as we find it in the sour curd very often. Hence we find when sour curd is put into the cheese-room the fluid naturally separates from the solids and runs on the floor, and we have leaky cheese. You will thus see that there are two classes of acid, and that which we want to use is the assimilating acid, induced by heating the milk previously. Maturing milk is an ambiguous term, the meaning of which cheese-makers do not understand, but when you convey the idea that by raising your temperature to 90 or 95 you develop an acid which will assimilate all the solids and fluids and form a plastic whole, it becomes clearer. There are three parts in cheese—butter, casein and moisture, in nearly equal parts. You require, then, a condition in which these three mix together in some form, the form which we call cheese; and the class of cheese we want is that which will command the highest price in the market. This is a fine point, and I think it has never been taken up. I have been studying it very closely for the last couple of years, and I believe the cultivation of the assimilating acid is really the secret of cheese-making.

Mr. Alexander.—What did you find the best method of handling porous curd?

Prof. Robertson.—The very best plan in my opinion is to maintain the warmth of the curd; to keep it at a temperature of over 94 up to the time that sufficient acid has developed to mellow it fully, and it is ripe for salting. As I explained to you last night, pin-holes are the result of the formation of gas, which makes room for itself. That gas is the product of fermentation caused by certain objectionable germs. So long as fermentation goes on gas is generated, and must make room for itself, and in this case does so

by making pin-holes in the curd. My aim would not be so much to get rid of that gas as to get rid of its cause. By keeping it quite warm you develop the proper lactic acid, the action of which on this other fermentation is to arrest it completely. If sufficient lactic acid be developed the other fermentation resulting in the generation of gas is completely stopped. Therefore, keep the curd warm to develop lactic acid, and to get rid of the gas afterwards is purely mechanical.

The PRESIDENT.—Would you not term that fermentation, which produces no gas, decomposition?

Prof. ROBERTSON.—I think so; I think all fermentation is decomposition. The formation of lactic acid implies decomposition.

The PRESIDENT.—In general terms, decomposition is decay, as I understand it?

Prof. ROBERTSON.—Well, you can have two kinds. You can decompose milk by keeping it very warm and developing acid, or by causing it to ferment without much acid at all. The difference is very subtle. I have learned a good deal on a difficult subject from the remarks of the President. In regard to the fermentation and the "two acids" there seems to be a difference of terminology, and I would like to make this plain. Chemically speaking there is but one milk acid, one lactic acid. Lest confusion should arise on account of this matter being criticised by chemists I would prefer not to use the term "assimilating acid" because in the chemistry of milk there is no assimilating or disintegrating acid; it is all the same. The development of the same acid under different sets of conditions will give either assimilation or disintegration. Its development up to a certain point enables you to bind together the substances that make cheese, and beyond that point it disintegrates them. The assimilation of the casein, the fat, and the moisture in cheese, is not due to action of lactic acid so much as what I call the Cheddar factor. I find that in making all kinds of "fancy" cheese the milk is exposed to the germs of certain curing-rooms and milk-rooms where the whole air is filled with germs of a certain kind. If milk be put into rooms where Roquefort cheese is made, and cured in that room, it will turn out Roquefort cheese in spite of all the processes known. Cheddar cheese seems to me to be produced by the ordinary fermenting germs found in all ordinary air. If you notice a beam of light you will see floating in it little particles. Among these are the seeds or spores of certain organisms, which, on a suitable field, will grow. It is the fermenting and ripening factor in making ordinary Cheddar cheese that matures milk and helps this fermentation. The fermenting process is started by these ordinary air germs, and the lactic acid, I think, arrests the development of and destroys other germs injurious to the cheese.

Mr. BISSELL.—What is the difference between all these big words "oxidation, fermentation and aeration?"

Prof. ROBERTSON.—I would not attempt an exact explanation of those words. I would simply call the changes, ripening of the milk, souring the curd, and curing the cheese. I would include in those three terms all the rest.

Mr. BISSELL.—Don't you think it would be better if our president would come out and call it acid instead of fermentation?

The PRESIDENT.—I would like you to understand me. Our terms are badly mixed up, and mean many things; and very little, many of them. I believe that the whole process of cheese-making in the later stages, from the time the curd assumes a certain consistency till the cheese is completely made, is a certain class of fermentation; that is what I believe it to be. That fermentation is developed in a certain temperature between 95 and 98. That is my practical experience, and what I would like the cheese-makers of this country to understand. We want a certain class of assimilating acid. If you chill curd down to 90 in the change, you will have poor cheese, but if you keep it up to 95 or 98 you will have that character we require. There is one matter in reference to which I would like to ask Professor Robertson's meaning. He said he drew whey perfectly sweet; what meaning does that convey?

Prof. ROBERTSON.—I meant that the whey would be perfectly sweet according to the standard of our tests for acid; that is, when the ordinary tests used by cheese-makers

failed to reveal the presence of acid. These tests are the taste, the smell, and the hot iron. I do not mean chemically sweet, but practically sweet.

Mr. ALEXANDER.—There is a question I would like to ask, not for myself but for some others. There are cheese-makers so screwed down that they cannot afford to procure appliances that will produce the most favourable results, and they do not know whether a curd mill is absolutely needed in a factory.

Prof. ROBERTSON.—I should consider it quite indispensable.

DAIRY COWS.

On the subject of dairy cows, Honourable Harris Lewis said: The dairy cow if kept comfortably in these latitudes is indoors about 180 days of the year. I know of no other place or way in which she can be kept comfortably than in the stable, where it never freezes; where the gentle zephyrs of Canada and northern New York never blow. After she has been imprisoned that length of time, and the grass is beginning to grow, and the days to get warm and suitable, I think you should just open your gate and "let her go to grass." There is nothing you can do for a cow so grateful as this, to let her go to pasture just when the earlier grasses are starting, and let her crop them from day to day, as she will do. There is a very great quantity of this grass that she would never touch if kept in the stable and out of the pasture two weeks longer. This grass will grow upright and coarse and unpalatable; grow up all the season, and in the fall decay. I want the cow to eat this grass, and she wants to eat it too. Before she goes out to this pasture in the morning, and after she returns from it at night you should give her all the hay you can coax her to eat, the most perfect hay you can produce. If you do this the change from hay to pasture is so gradual that it does no harm, and the cow herself scarcely realizes the change; no bad result arises from the milk secretion being overtaxed, as it is when a cow is kept on hay until she gets a full feed of grass. And now I will suppose you have turned her out on permanent pasture; a pasture fitted in the best manner for the seed, and seeded with all the grasses indigenous to your soil. Sow all the grasses indigenous to your soil, and seed liberally on a well manured piece of land. Well manured for pasture, I should say, would be about forty loads per acre, well worked in; and then about 200 pounds of ground bone put on it. That will give you a pasture as permanent as the rocks that you meet within the fields. Now, when there is any failure apparent in the grass, I would have some kind of food in the barn night and morning. I don't know anything better for a butter milker than the refuse of wheat, wheat bran or straw—middlings, as they call it. But early cut hay—I will call it dried grass, for fear you might get old and dried hay—cut just as you would the first crop and put away; give the cow all she will eat of that in addition to the scanty pasture, and you will be surprised at the quantity of milk you will get; even if you have not got a Holstein. A cow need not be a Holstein to want something to eat, and my friend here (Mr. McCrae) knows that even the Holstein does not give this mill-pond full of milk every day without something to eat. There was one time an enterprising Yankee in our State who lived by a stream, and he built him a mill-pond and set up a mill, and set to work sawing; a man who in appearance somewhat reminded me of my friend over there (Mr. Bissell). Well, just as he got nicely to work there came along a freshet and tore away his mill-pond. But he was not to be put off that way, and he said to his boys, "Boys, I will set one of you to work up there to milk that Holstein cow of ours, and we can run the saw mill by her milk." They did so, but he had to put a boy at each side of her—for one could not milk fast enough—and it took four men to carry her all the food she wanted, and eight boys to carry her water to drink. Well, they worked like that for a time, but by and by, after he had scratched his head awhile, and thought the matter over a bit, he called to the boys to stop, and said, "Why boys, I think we could have done this sawing cheaper by hand." (Laughter.)

Well, I was talking about pasture. About the middle or 20th of October, in our latitude, you had better place your cows in winter quarters. Take them off the pasture,

and don't leave them there till they have got the last mouthful of grass; there are a good many who do that. When I was on my way here last Tuesday I saw lots of cows out at pasture. Now you cannot keep pasture up, gentlemen, and have cows cropping it all winter; not by a long shot. To have pasture permanent you must treat it kindly. Now, you can go and top-dress pasture after the middle of October; you can pulverize the manure; it will be a nuisance if it is not pulverized. Do that in October, and all the odour will be gone by spring. You can top-dress cow pasture with horse manure any time between spring and fall and have it unobjectionable to the cow in the spring. It costs a good deal to feed pasture down; you need to make it permanent; and it is bad policy to plough up and seed. Prepare your ground well, put on your seed liberally and of every kind that will grow in your latitude, and your cows will have less reason to complain of their fare, and so will your milkman of their milk.

Mr. Bissell.—What about salting cows every day, and giving them sulphur twice a week?

Mr. Lewis.—I would keep my cows so they could get it whenever they want it; they know that a great deal better than I do, and never eat it unless they want it.

Mr. Bissell.—But about the sulphur?

Mr. Lewis.—For about thirty years I have fed sulphur in my dairy mixed with salt; about a table spoonful of sulphur to a quart of salt. Let them eat that whenever they want salt. The sulphur goes into the circulation and destroys a great many things we would rather not retain.

Prof. Robertson.—Have you ever found any injurious effects? Have you ever made any test of using this salt and sulphur for a time and then discontinuing it?

Mr. Lewis.—No; I first fed sulphur for bloody murrain. I had a rather moist meadow I used to feed, and lost eight cows in about a week with bloody murrain. I then began to feed sulphur, and I never had a case after.

A Member.—What effect would sulphur have on the milk?

Mr. Lewis.—None whatever, if fed in the proportions of salt and sulphur I have already mentioned.

Mr. Bissell.—I use it all the year round, as regularly as I take my meals?

Mr. Whorry.—Before the people all go away I would like to ask Professor Robertson if he would recommend the makers at this convention to adopt the system of keeping curd warm and covering it up in place of aeration to get rid of pin holes.

Prof. Robertson.—I certainly would. That has been the pith of my remarks. But there are certain other odours, apart from this gas, which aeration helps to remove.

VOTES OF THANKS.

Mr. Derbyshire.—I would move a vote of thanks from the members of this Association to the Minister of Agriculture for his courtesy in permitting the attendance here of Professor Robertson and Mr. Blue, and that our thanks be also extended to those gentlemen for their excellent addresses and the other important services they have rendered the Association during the present meeting. We appreciate their services most highly, and also the courtesy of the Government in placing their services at our disposal.

The motion was seconded by Mr. J. Miller, and carried by a standing vote.

On motion of Mr. Derbyshire, seconded by Mr. McCrae, the thanks of the Association were tendered to the other gentlemen who had contributed papers or addresses to the meeting.

The thanks of the Association were also expressed to the County Council for allowing them the use of the Court House, after which the Convention adjourned.

III.—ONTARIO CREAMERIES ASSOCIATION.

OFFICERS OF THE ASSOCIATION.

President, - - - - - - - JOHN HANNAH, Seaforth.

1st Vice-President, - - - - - - D. DERBYSHIRE, Brockville.

2nd Vice-President, - - - - - - J. T. BRILL, Guelph.

Secretary and Treasurer, - - - - M. MOYER, Georgetown.

Directors:

Division No. 1.—ALBERT HAGAR, Plantagenet.

Division No. 2.—R. J. GRAHAM, Belleville.

Division No. 3.—JAMES MILLER, Spencerville.

Division No. 4.—JOHN SPRAGUE, Ameliasburg.

Division No. 5.—GEORGE GARNETT, Bethany.

Division No. 6.—THOMAS JOHNSTON, Toronto.

Division No. 7.—W. H. BRUBACHER, St. Jacobs.

Division No. 8.—V. E. FULLER, Hamilton.

Division No. 9.—J. T. MOORE, St. Marys.

Division No. 10.—A. WENGER, Ayton.

Division No. 11.—E. MILLER, Parkhill.

Division No. 12.—PETER GRAHAM, M.P.P., Warwick West.

Division No. 13.—GEORGE BROWNING, Ripley.

MEMBERS OF THE CREAMERY ASSOCIATION.

Name.	Post Office.	Name.	Post Office.
D. Derbyshire	Brockville.	P. A. Carpenter	Collingwood.
M. Moyer	Georgetown.	R. J. Graham	Belleville.
E. Miller	Parkhill.	J. T. Brill	Guelph.
John Sprague	Ameliasburg.	S. R. Brill	Teeswater.
W. J. Armstrong	Guelph.	S. Diamond	Barrie.
John Hannah	Seaforth.	A. Wenger	Ayton.
Robt. McCartney	Seaforth.	Fred. Filsinger	Mildmay.
Thomas Johnston	Toronto.	W. T. Pattulo	Alton.
James F. Ross	Seaforth.	Henry Groff	Elmira.
C. R. Cooper	Toronto.	A. Hagar	Plantagenet.
Aaron Shantz	Haysville.	W. H. Lowes	Bethany.
Aaron Good	Blair.	W. H. Brubacher	St. Jacobs.
Campbell Bros	Penetanguishene.	Geo. Wetzlaufer	Amulree.
G. S. Frazer	New York.	James Cheesman	Toronto.
J. N. Zinkann	Wellesley.	James Vance	Roseville.
John W. Thompson	Norway.	Alfred Boyd	Toronto.
Geo. Garnett	Bethany.	J. E. Baillie	Toronto.
John Ramsay	Eden Mills.	W. Baillie	Selkirk.

SECOND ANNUAL CONVENTION

OF THE

ONTARIO CREAMERIES ASSOCIATION.

The Second Annual Meeting of the Ontario Creameries Association was held in the Temperance Hall, in the city of Toronto, on the 24th and 25th days of February, 1887. Mr. John Hannah, of Seaforth, President of the Association, occupied the chair.

THE PRESIDENT'S ADDRESS.

Gentlemen,—At this the first annual convention of the Ontario Creameries Association, I have much pleasure in welcoming the members of the Association to our meeting. I trust that the time occupied in discussing matters relating to our interests, whether as patrons of creameries, owners, managers, butter dealers, butter makers or manufacturers of or dealers in dairy supplies, may be time profitably spent, that we may go forth from this convention with renewed strength and determination to still further raise the standard of Canadian butter in the markets of the world, and that the meeting together of representative men from the different parts of the province may serve to provide that friendliness of feeling and unity of action without which our success cannot be achieved. As some present may not be acquainted with the formation of this Association, I would take this opportunity of stating briefly the steps which have been taken in its workings up to the present time. Twenty years ago the Ontario Dairymen's Association was formed and from that time until now it has been receiving aid from the Ontario Government. Ten years ago the association was divided into two branches,—the Eastern and Western Dairymen's Associations,—with the Government grant divided between them. These Associations have done good work in improving the quality of our cheese; but it was felt that they had not done much, if anything, to improve the butter industry, and as creameries increased in numbers, and their usefulness and importance in improving the quality of our butter became apparent, it was felt by creamerymen that the Association should do more for the creamery interest than they had done in the past. At the convention of the Western Dairymen's Association held at Woodstock last year, a number of persons interested in the creamery business drew the attention of the convention to the facts which were admitted, and a resolution was passed asking the Ontario Government to make a grant to the creamery industry and advising the creamerymen to form an organization in their own special interest.

A meeting of creamerymen was called to meet at the city of Guelph, when it was decided to form an Association. A provisional board of directors was chosen and a committee was appointed to wait on the Government and ask for aid. The result was that the Association was incorporated under the name of the "Ontario Creameries Association," and the sum of $500 was placed in the estimates and voted by the Legislature to aid the new organization.

At a meeting held in the month of May last year in this city, the present officers and directors were appointed. Owing to the lateness of the season it was found to be impossible to do much the first year, although the directors decided to pay the expenses of lecturers who might be called to attend meetings in the creamery interest. The appointing of instructors to visit the creameries and give information to the butter-makers in the handling of the cream and butter was also discussed by the board but was laid over for future consideration and will doubtless come up for discussion at the present convention.

The past season has been one of progress, a number of creameries being put in operation and an increase in the quality manufactured in nearly all the creameries before in operation. The season has been on the whole favourable for the manufacture of butter. The spring opened earlier than usual, with a rich growth of grass, although in some sections it was followed with a continued spell of dry weather, which had the effect of reducing the make very much. But the fall was more favourable the rains being ample to ensure a good growth of grass and the absence of frosts made the quality all that could be desired. Prices have been about the same as in 1885; the early make, viz., May and June butter, was difficult to sell. Dealers apparently were afraid to risk paying prices asked by creamery men, but there was a steady improvement as the season advanced, which fetched prices up to a profitable figure for the fall makers.

The subject of winter dairying will, in my opinion, strike the key note as to the remedy of low prices in May and June, as, by equalizing the product of the whole year and perhaps making the greatest amount in the winter, it would steady the prices. There would then be no great rush of goods on the market at one time, and as there is a growing demand for fresh made butter at all times, the goods could then be marketed while fresh and most valuable.

It is also thought that the exhibit of creamery butter at the Indian and Colonial Exhibition last October, made by the Ontario Government, will have a good effect in opening fresh markets for our goods; but I will not refer to this subject further, as we have on our programme a paper on the future of the foreign markets for Canadian butter by Prof. Robertson, who had charge of the exhibit and who will doubtless be able to give us valuable information.

In view of the fact that the Dominion exports as much in value of dairy produce as it exports of horses, cattle, sheep and swine combined, it justifies the increased attention that is being paid to this branch of farming, and as the cheese industry is in a very prosperous condition, with which result the influence of the Dairymen's Association is mainly to be credited, to the Ontario Creameries Association we must look for the like improvement in our butter trade. To accomplish this end let us work hand in hand, sinking all local or personal feelings; let our sole aim be to make our butter sought after for its excellence, instead of being as now an article shunned for its many defects.

Mr. Derbyshire.—I am sure that the Government was amply justified in putting in the estimates a sum of $500 for this important object. The butter trade has been taken out of our hands by the Americans, who are now furnishing a fresh sweet article regularly to the English market. We have, however, every facility in this province for making good butter, and there is no reason why we should not redeem our good name by establishing creameries, by looking after the matter in a systematic way, and by furnishing a good quality of butter to the market regularly. We cannot expect to succeed in the butter business without that careful attention, which is a requisite to success in every other business. I am satisfied that by united efforts we can place it in as good a position as the cheese business occupies now. The Indian and Colonial Exhibition was of great benefit both to our cheese trade and to our butter trade. The exhibit was put up in excellent shape and handled only by Prof. Robertson and it procured a liberal allowance of free advertising. All we need do now is to look carefully after our business, to establish creameries, to use the very best material and to be careful to send to the markets a regular supply of fancy butter. In this way alone we can work up a butter trade. Your

address, sir, was in every way a laudable one. I hope that at our next annual meeting we shall assemble not by the half dozen, but in hundreds, to discuss these important matters. It is really astonishing that the dairy business, upon which depends so much of the future success of this province and Dominion, is not more carefully looked after. One would suppose that the farmers who furnish milk to the factories would take a deep interest in the matter, because the success of dairy farming means gain to them, and the neglect and failure of dairy farming means loss to them. The dairy interest has already proved a great source of revenue to the province, and I believe that revenue can be increased.

Mr. BRILL.—It affords me great pleasure to bear testimony to the importance of the creamery industry referred to in the able address we have heard this afternoon. The cheese industry has prospered to such an extent that the trade now runs into millions, but the creamery business is only in its infancy. We have only some forty creameries in Canada, and there is no reason why this industry should not prosper and attain the same proportions that cheese has done. Ten years ago in Germany they began to take this business up and now they are exporting large quantities to London, Liverpool, Birmingham and other British ports. In Ireland they have gone into the creamery business extensively, and their butter goes fresh and sweet into the English markets. There is no fear for our butter trade if we have the right men to make butter and take care always to have it made of the finest quality. I was told to-day that it was impossible to get a pound of good butter in Toronto. There is no reason why this state of things should exist; we have all the natural advantages for making good butter, and all that is needed is greater attention to processes of manufacture. The number of creameries should be increased, and systematic instruction should be given in butter-making. The sooner something is done in that direction, the better it will be for the province.

Mr. JOHN SPRAGUE.—This has been a very eventful year for the butter-making industry in this country. The Dominion Parliament has passed an act prohibiting the manufacture and importation of oleomargarine. In past years the Chicago hog has been a great enemy to the Canadian cow. The passage of this law will be a great benefit to the butter industry. I believe that it will greatly help to give Canadian butter a good reputation in the old country. I believe that by paying greater attention to the butter industry we shall materially aid the industry of cheese-making; for if we manufacture more cheese than is wanted it will have an injurious effect upon the trade. We believe that we can produce as good butter in Ontario as anywhere in the world. Our grasses are sweet and our climate is suitable. So far as the demand is concerned even our home markets are badly supplied. All the cities of Ontario are to-day asking for fine butter —what we want to do is to make fine butter and to sell it as soon after it is churned as possible. There has been in the past too much holding of butter for a high price. We are creatures of habit; in olden times the old women made their butter, packed it in the cellar and kept it until the fall, when speculators came around and bought it up. I asked an American gentleman, "When do you sell your butter so as to get the best price?" and his answer was, "The day we churn it." There was a real meaning in that. Butter is, I think, better the day it is churned than at any other time. The great trouble in this country has been first, the use of oleomargarine, and next, the disposition of butter-makers to hold the article for a high price.

The PRESIDENT.—Speaking of oleomargarine I may say that last November I attended a meeting of the Butter, Cheese, and Egg Association in Chicago. There were representatives there from every part of the United States. I had no idea of the strong feeling of dairymen against oleomargarine until I heard the discussion at that meeting. They occupied three-fourths of the time discussing that question alone. You would suppose that men who had been in the dairy business all their lives would be mild men, but it was surprising to hear what strong language they used about that article. The English language seemed scarcely to have words strong enough for them. I introduced myself as a representative of the Ontario Creameries Association and received a hearty welcome, such as dairymen usually give to their brethren. I took occasion there to claim a little credit for what Canada had done in prohibiting the manufacture and importation of this article.

Mr. Derbyshire.—I believe that the introduction of oleomargarine was largely due to the bad quality of our butter and the negligence of our dairymen. I believe that the best quality of oleomargarine—not the article made out of cattle who have died of disease, but properly made—is a blessing in disguise. It is clean, and there is a great deal of butter made, in the Brockville section at least, that is not clean. It is held until it is unfit for human food. The people were demanding fresh, sweet butter; oleomargarine was put fresh, sweet and clean on the market, and it was better than the butter that the farmers of this country were selling. What we want is to make a fancy article of butter and exhibit the fact that we can do so regularly, and we shall have no rival in artificial butter.

PATRONAGE AND INSTRUCTION.

Mr. Moyer then read the following address on "How best to Secure the Patronage of the Farmer for the Creamery, and give the necessary Instructions to secure the best results:"

I was asked to prepare a paper on the above subject and was also asked not to make it long. I am satisfied whether I made anything of the former or not, that I have made a complete success of the latter.

This subject may by some be considered almost out of place, or unnecessary to be discussed, and yet, to the practical creamery man, there is nothing connected with the business which requires so much thought, skill, careful consideration, and management as the part with which I have to deal in this paper.

Wherever the patronage, either to a cheese factory or creamery, is good, there the business is a success; and where there is a want of interest and support on the part of the farmers there the business is suffering, has uphill work, and a small chance of success. Hence the importance of my subject.

The question may be asked: If the creamery business is profitable to the farmers why should there be any difficulty in securing their patronage? Want of a better knowledge of the business is perhaps the principal cause, and the natural tendency to stick to their old ideas and notions is another. Among farmers, as well as any other class of people, there are many men of many minds, and as the women have all a say in this matter, also, it makes an endless variety of opinions to contend with. I don't think that I say too much when I say that you find more variety of opinion on the farm than in any other line of business life. It is often asked by farmers themselves, why it is so much more difficult to get farmers united on any plan for their own interests than men engaged in any other line of business? This is easily accounted for. The millers, for instance, in organizing for some purpose in connection with their business, are all millers and nothing else; but with the farmers it is altogether different. One may be a horse fancier, another takes a fancy to well-bred cattle, another makes a hobby of sheep, and nothing suits the next except growing grain, and yet, all are farmers. Now if you call a meeting to take into consideration the propriety of starting a creamery, or to discuss the question of dairying, those who take an interest in dairying would attend, but it would not attract the horsemen. Thus we find great difficulty in getting the farmers united in any one line of their various branches of work. This is the great hindrance in building up either the creamery or cheese business, in which, in order to make it a success, united work is essential. How to get them united and make good dairymen of material so variously disposed, has fallen to my lot to solve in this paper. I must admit that the longer I look at it the further the solution seems to move beyond my reach. With all these peculiar fancies of the farmer, he, like anybody else, will take a liking to anything that pays. If a farmer takes a great interest in horses, he, through good management, which naturally grows out of his love to that part of farm life, also makes horses pay. It is not always that he is a natural horse fancier, but he may have been led to deal in horses because of the fact that the business paid him. I believe that a man's liking to any particular line of business is oftener regulated by the profits than by any natural predilection

or inclination. I feel satisfied that a fairly good dairyman can be made of any kind of a farmer, and in fact you may get him to fall in love with it, if you can convince him that the profits are all right. As the profits depend very much in proportion as farmers support the creamery, it is hard to show good profits before they give their undivided patronage. The cheese-factory system has now been introduced over twenty years, and while it is a grand success in some parts, it is still struggling under difficulties and often entirely fails in some other parts. Where factories are a success the farmers are all in love with the business, because through their increased support the profits are satisfactory, and they are realizing the full benefit of the business. This requires time, patience, and many a sacrifice on the part of those who engage in the early struggles of its life. Although, that we may benefit much by their example, we can only hope for the success of the creamery in time, through faithful work on the part of those whose faith in its future possibilities has prompted them to lead in its onward march to progress. The creameries should be conducted by reliable men, and the best system adopted to establish greater confidence between the factory and its patrons. Harmony on the part of the creamery men is essential to its success. They should unite upon the best but only one set of apparatus and one system, so that the instructions to the farmers are in one line and not conflicting with each other. A proper person should be appointed to regulate this matter, who should keep himself well posted on all the new improvements or inventions, and never recommend anything without first making a thorough test of it, and then only through the approval of a board appointed by the annual convention of the creamery association, consisting of, say, five persons. This would save the farmers from being gulled by inexperienced and unprincipled men with articles which are useless, plans which are impracticable, which disgust them and make them suspicious, at a loss whom to believe and by whom to be guided. Past experience enables us to see the importance of a board as above referred to, in connection with the person who may be at the head of the dairy work. Practical men should be united and honestly strive to arrive at the best possible system, and then instruct the farmers, as it were, in one school, or from one series of books. One of the most damaging influences in the business is the fact that so many conflicting ideas were dished out to the farmer, through want of knowledge and experience, or through some petty jealousy, and therefore the necessity of union on the part of those who aim for the welfare of the industry.

One of the great troubles in giving instructions to the farmers is the difficulty of reaching them. Life is too short to call on them from house to house, and therefore the only way to do it is to get them sufficiently interested to attend meetings, where they will be addressed by a competent person whose ideas are backed up by all the practical men, and who thoroughly understands all the approved systems, and also all the difficulties that may arise to the farmer. He must be possessed of the aptness to teach, so that he can explain the advantages of the proper system, and also in a fair and reasonable way assist them in overcoming such difficulties as may present themselves. He must be able to conduct himself and his meetings in such a way that he will gain the confidence of the farmer. At first these meetings may only be attended by comparatively a few, but if he makes the desired impression on those that do attend, their influence will bring out a larger number the next time. I believe these meetings could be made so interesting and profitable that every farmer would not only attend them, but would be anxious to have them held more frequently. Just as soon as the farmers see that the business is in the hands of men who earnestly work for the good of the industry, which will result in their benefit, they will be ready to do their share of the work. Too many sharpers have been preying on the farmers, which makes them suspicious and overly cautious, but honest work will soon remove that feeling, and once confidence is established their patronage and generous support are secured.

Not only should the best system of handling milk, etc., be explained, but they should understand the possibilities of the cow with her full powers, which will induce them to increase their herds, to improve them by weeding out those that do not pay, and to breed from the better strains. The dairyman should look upon the cow as a machine to make milk of the best quality and for no other purpose. The idea of the general purpose cow must be abandoned.

Farmers must understand that if it pays at all to convert food into milk by means of the cow-machine, it pays best to run that machine to her full capacity. They must not calculate the profits of dairying from cows which are half fed in the summer and half starved in the winter, but learn what it is possible to make from cows well managed. They should not keep a cow from whose milk it takes more than 25lbs. to make a lb. of butter. They should be instructed in the best system of feeding, and the best and most profitable way of handling the milk for cream, and they should understand the value of skim milk, not only as a human food, or food for stock, but also its value returned through stock as a fertilizer. They should understand that by selling the cream only, nearly all is again returned to the soil, and therefore that there is very little strain in the land.

The farmer cannot produce anything for which he gets as much money and for which he gives as little value as in cream or butter. To give the least value for the most money, is the most profitable business to pursue. He should realize that if he makes only fifteen cents for the cream that makes a pound of butter, and has the skim milk besides, it pays him better than either beef, pork or wheat at the present prices.

But the possibilities, or I should say the probabilities, are that as soon as we have built up our butter industry then our prices will be considerably higher. When all this is once understood by our farmers I believe they will fall in love with the business, and it will in time be a hardship if one should be deprived of the grand advantages of the creamery.

To secure all this, constant, honest, and competent work is required. The work is, however, not all to be done on the part of the farmers, but the factory must also make improvements. Nothing has caused me more trouble, or has had in my experience more to do in causing a slackness on the part of my patrons, than the fact that it is so hard to get the cream so carefully and honestly skimmed that it is of equal value. There is a slight difference in cream, but the great trouble is due to skimming. The system of testing about twice a month checks the evil to some extent, but satisfaction will not be arrived at until everybody's cream is tested every day and each patron allowed for what butter his cream contains. This I believe can be accomplished by the oiling system now in use by some creameries in the States, but upon which I believe I can suggest some improvements, which I will show before the Convention is over.

To best secure the patronage of the farmers to the creamery, therefore, requires to give them more light on the business, and to present them a system as little objectionable as possible. This can only be done through meetings as already suggested, and through united effort and harmony on the part of those engaged in the business.

Mr. Derbyshire.—I think the paper is a splendid one, and just about the right length; long papers which take an hour and a-half to read are a great hindrance to the success of a convention; they tend to prevent discussion, by wearying the members of the subject; while a short paper just touching on the various points arouses interest and brings out a full discussion. Now as to the subject of Mr. Moyer's paper, I know that in the cheese business as well as in the creamery business, the trouble we have had is with men starting in it who haven't level heads. Professor Arnold says the first requisite for a man in the dairy business is a level head. Lawyers can be made out of almost any kind of material, but to run a creamery or a cheese factory and please thirty or more patrons, does require a man with all his wits about him. There are cheese factories where they do not understand the business, where they use a poor building, poor machinery, and poor milk, and sell the cheese for a small price—there the cheese business is a failure. I am satisfied that the trouble with the creamery business has been poor management. The first requisite is to have a proper place to handle the cream, the next thing is to have a man who thoroughly understands the management of it; and finally, you want to demonstrate to those who sell the cream, that you have the ability to handle it. On the other

hand, if you want to make a destruction of the business, as some have done in the past, you want to have a building where you can stick your fingers between the cracks and there set your milk; you want to have a man who has been working cheese before and knows nothing about butter; you want to put the butter in a place where it will keep warm or cold, just as the atmosphere changes; and you want to hold it until the fall, until it begins to get unfit for use, then there is nothing which to the people in the vicinity of a creamery so clearly demonstrates its failure as not to get the money for the product in the fall. The farmers require money to satisfy them and the success of a creamery depends very largely upon the amount of money you can furnish in the fall. We should have a professor at Guelph who thoroughly understands the business, and men should be sent there to receive the necessary training in order that they might act as instructors throughout the country. We have got in Ontario the best farms, the best cattle, the best grass, the best climate in the world, for producing butter, and I don't see any reason why we fail to get our true position except it be the want of skill and knowledge. Why, some time ago it was said that when fancy cheese was placed on every table, the millenium would be at hand. Now we have succeeded in placing fancy cheese on every table and I do not see why we can't do as well with butter. In some hotels you can get pretty fair butter, but the bulk of it is unfit for food. We should be able to place fancy butter on every man's table, and we should demand a fancy price. We should ask a price that will pay us for making a good article, and we should make the butter that will command the price. Don't let a man start in that business who knows nothing about it. If I were to start a shop in the city of Toronto in competing with men who have been here for years, people would laugh at me, and they would be right. Then how can men establish creameries without experience, without having thoroughly learned the business, and expect to succeed.

The PRESIDENT.—There is one matter which has given a great deal of serious trouble to creamery men, and that is testing.

Mr. MOYER.—I have been working and experimenting at that more or less the whole summer, and, in fact, I thought I was the only one working in that line. There is a test by melting butter—it is a kind of separating system. You take a little bottle, about eight inches long, with a screw top instead of a cork to close it; and into this bottle put about three inches of cream. A number of these bottles are put into a frame and tumbled round until the cream is all churned. I am not particular whether you get it in a granulated form or not; then, by an attachment to your engine, you have a pipe run underneath, so as to melt the butter. I had it all right, but sometimes the cheese elements would not separate from the butter. It will separate nicely just when the cream is at a certain stage of sourness, but when it is quite sour it will not, and in that case, of course, the measuring would not be accurate. Then just loosen the screw tops a little, turn the whole thing to let the butter-milk run out, and fill in warm water and close them tight again, and the result of the test as shown on the table will be very accurate. This test can be made quickly. The churning involves no extra work, and the running off of the butter-milk takes no appreciable time. A little time is occupied in putting in the water. When all this is done, let your book-keeper note down the percentage of fat on these creams, and the quantity of butter is calculated accordingly. The objection has been made that in so small a quantity a little of the cream sticks, and it is difficult to put it into the bottle with the required accuracy. To overcome this the exact quantity must be taken out of the cream by means of the air tube. When I take this out there is more or less cream on the outside. I put a little rubber on the top of the measuring pail, and when I pull it out it scrapes off the cream on the outside. I believe we can get this into use in all our factories, and that it would put an end to disputes about the cream, and greatly help the creamery business.

After some discussion on the qualities of rival salts for dairy purposes the Association adjourned until evening.

BUTTER-MAKING BY CENTRIFUGAL PROCESS.

At the opening of the evening session, the following paper was read by Mr. Sprague:

I first might say that my promise to give a paper on the method of making butter by the centrifugal process, is a light and easy task, as I only need say that after having the cream, making butter is nearly the same as the process followed for many years.

The principal difference is in taking the cream from the milk.

At the present time we only have two practical methods for taking cream from milk. One is by deep or shallow setting—the other is taking cream from milk by centrifugal force. This process is, comparatively speaking, a new discovery, having only been in practical use in this country for the last three years. By this method cream is instantly taken from the milk, and as soon as possible after the milk is taken from the cow.

My experience is that cream taken by this process is superior in quality to cream taken by setting milk—superior in the points of cleanliness and sweetness, as well as in uniformity of age.

Uniformity of age in cream is of importance in making fine butter. I hold that cream taken from milk by setting varies in age from one to twenty-four hours, consequently, it varies in its qualities for making butter.

By this centrifugal process a gain is claimed in yield of butter from the milk. The skimmed milk is also of more value; being perfectly sweet it is better for feeding, of more value for culinary purposes, and, if required for making cheese, it is also of more value than skim milk for setting.

In speaking of making butter I presume I should first say something of the implements required.

In order to be fully understood I will speak of the requirements of a creamery to manufacture, say from five to seven thousand pounds of milk per day. To manufacture this amount of milk you want a four-horse power engine, two laval separators, twelve cream cans holding five gallons each, one churn, and one butter-worker; also, such small utensils as scales, ladles, strainers, etc., and, above all things, a good, reliable thermometer.

The cream when taken is usually of the same temperature as the butter-room, which, in summer, is too high for churning. As fast as the cream-cans are filled with cream they are set in cold water and cooled down to 58 degrees. If sweet cream butter is to be made the cream is at once churned.

The time occupied in churning should be about forty minutes, but this varies according to circumstances, and the butter-maker has to be guided by the progress made in the formation of butter in granular form, not churning longer than suffices to get it into grains the size of wheat or corn. At this stage draw off the milk and replace it with about same quantity of clear, cold spring water. Again start the churn slowly for two or three minutes, and this washing should be repeated two or more times, using less water at the latter washings. The butter is now ready to be taken from the churn; the granular form has become enlarged and the butter has taken its character in colour and quality.

The butter is now taken from the churn, weighed and evenly spread on the worker, and with one ounce of salt to the pound of butter, the salt being carefully and evenly worked through the mess. The butter is then put in tin cans about twenty-two inches high and eight inches in diameter, and at once put away and kept at a temperature of fifty-five degrees for twenty-four hours; then put back on the butter-worker and worked out dry. It is now ready to put in tubs or be made into rolls or prints.

If sour-cream butter is to be made, the cream is held, allowing time for acidity to form.

The art of good butter-making cannot be learned by any written rules; it can only be acquired by carefulness in all details and by years of practical experience.

Following up his paper Mr. Sprague said :

The centrifugal process compared with the old method of cream-raising seems to me like the railroad compared with the old stage coach, or the telegraph system compared with the post office department. For one thing, the milk is well aerated in the process and any foreign substance is at once separated from it. My experience has been, that I have made higher class butter by the cream from the centrifugal process than I ever have from the old method. In regard to quantity, I have seen great variations. Our friend here, Mr. Graham, puts the difference between the systems at ten per cent., though I have seen days that I obtained as much one way as the other ; but in the centrifugal process you are sure to get all the butter that there is in the milk. If there are one hundred pounds of butter in four hundred of milk you are sure to get it out. In making sour cream butter, I have found that some days we get a better yield than others, and in holding over I also found the same result. For two years I held it over twenty-four hours, setting it away in ice water. Now I use it perfectly sweet, and I think I am getting just as large a yield and just as fine a butter ; so far as a fine, sweet, creamy flavour is concerned, that is what makes good butter, and customers say so. There have been great changes in these matters. I did not think three years ago that we could get butter, with good keeping qualities, from sweet cream. Now, I find I can get butter just as quick and get just as good value for it as I could for the other, if not better. The surrounding temperature and other matters have something to do with every day's churning. Every individual churning has its own individual character.

In regard to the keeping qualities of sweet cream butter, I would say that I made some to keep in June of last year, and it was perfectly good and sweet in the following December. But I am not in favour of keeping butter; the best market for it is the day on which it is churned, or as soon after as possible. Butter is an article that does not improve with age. It is a very delicate thing ; it partakes of the atmosphere and of anything with which it comes in contact, pine wood, spruce, tobacco and everything around it, in fact, that can be absorbed. For that reason great care is necessary in making butter to ensure perfect cleanliness everywhere. The best utensils that can be had should be procured, and every day's work should be observed. I have received the best results from churning forty minutes ; if I ran over that time I did not mind it so much, but if I brought the butter sooner, say as soon as twenty-five minutes, I always looked out for it and watched it closely and handled it carefully.

Mr. Boyle.—What is the cause when you get the butter in such a short time ?

Mr. Sprague.—That I cannot explain. It sometimes does come that way, however, I know, and when it does, I always look out for it.

Mr. Derbyshire.—One way would be to have the cream very warm when you begin to churn. I think there is great objection to the separation of the cream from the milk as soon as it comes from the cow. My friend Graham here, it appears, does not aerate the milk a particle, but turns it right into the tin as soon as he has enough to start the separator. He continues to run it through the separator while milking, and, of course, by the time he is through milking he is nearly through skimming. To get the best results the milk must be thoroughly aerated, and all the animal odours taken from it before you commence to separate. The temperature should be brought to the proper place before the separation commences. Mr. Sprague wants to churn immediately, because he is going to make some iron-clad skim-cheese. (Laughter.) Of course, I am totally against skim-cheese, just as much as I am against oleomargarine butter.

Mr. Sprague.—It does not give you the fever.

Mr. Derbyshire.—Oh, you are here to be dealt with, and I thought I might as well deal with you. (Laughter.) All our actions are governed considerably by the pocket, and of course, I haven't the slightest idea but that Mr. Sprague is correct in his own opinion, but I think I am right in mine. I confess that Mr. Sprague had me almost converted this morning on the subject of sweet cream butter, but I have been thinking since about this skim-cheese business, and I have come to the conclusion that it has something to do with his ideas on the subject. I prefer butter that is made from cream that has been skimmed after the milk has been well aerated.

Mr. Sprague.—The milk is perfectly aerated in the process of taking cream.

Mr. Derbyshire.—I am not so sure of that.

Mr. Sprague.—The skimmed milk is perfectly free from animal odours as soon as it has come through the separator.

Mr. Derbyshire.—The moment it goes into the separator you jerk the cream right out. The more perfect the milk when it goes into the separator, the more perfect the cream will be.

Mr. Sprague.—There's no doubt about that.

Mr. Derbyshire.—That is what we want. The first thing to do, if you are going to do anything at all with milk, whether it is butter or cheese or sending it to the city to be distributed to the patrons there, is to have the milk thoroughly aerated before it is taken away from the farm, or before it is put into the separator or sent to the factory. I believe the milk that we receive in the cities is not what it would be if we took perfect care of it from the beginning. When this perfect aeration has taken place we have a perfect cream. If it is put away in this sweet, nice condition for twenty-four hours, then the butter that we have is more perfectly flavoured, and a butter that will give better satisfaction to the consumers here or elsewhere. If we ship butter to Belleville, or to some place only a short distance away, it may not have the same knocking about and hardships to contend with that it would have if you sent it across the ocean. Consequently, I think that the butter that is treated as I say, is the butter that is going to reach Liverpool in the best condition.

Mr. Graham.—I think that Mr. Derbyshire is right in many respects. I cool the cream instead of cooling the milk. We have a Macpherson cooler, and just as soon as the cream is extracted it is run through the cooler and aerated. I am quite satisfied that it is all right that way. The first butter I made I made under Mr. Sprague's system of sweet cream, and now I am eating that butter myself. We like it ourselves at home and I am satisfied that it will keep. The only difficulty about it is, that most people are educated to eat acid butter, and when you give them sweet cream butter they are not satisfied with t. As Mr. Sprague says, his own customers—people that take a firkin or two—get used to it, and like it. There is a great deal in that, but it is difficult to find people who use sweet cream butter. They use it once or twice and say they don't like it. They want acid butter. We get more butter from the sweet cream, but I think as far as purity is concerned, the sooner the cream is extracted from the milk, before it is contaminated by anything, the purer the cream and butter will be.

Mr. McDonald.—I think we have a great deal to learn on this subject from European countries, where this thing has been reduced to a science. The correct theory and practice is, to separate the cream as soon as possible after it comes from the cow, and in that way it gets more aeration while going through the separator, than Mr. Derbyshire would get by letting the milk drop from the moon to the earth. (Laugher.)

Mr. Derbyshire.—The correct thing for the centrifugal process is by sweet cream. The first reason is, that animal matter in the milk is taken out, and in that way does not flavour the butter. If a little more butter is got from souring the cream, it is more than counterbalanced by the fact that you get the butter-milk sweet. It will more than balance the difference, and the butter-milk is of the same value as skim-milk when fresh, and very little, if any, value when sour. With regard to the milk, you must suit the taste of your patrons, but the cream flavour is the proper taste for butter, and the public taste is being educated that way, provided the cream is pure. With regard to acid butter of course, some people's taste is educated to like acid things. They are accustomed to vinegar, and of course they prefer acid butter, but the people who are accustomed to pure butter flavour prefer that from sweet cream and prefer it without salt, and this is the way the English taste is being educated.

Mr. Derbyshire.—Mr. President, there seems to be a misunderstanding as to what I am driving at. I don't want to sour the cream, but only to churn when the first signs

of acidity appear. Just when it is ready, that is the time I want to churn. I don't want to sour the cream; that's not the idea I expressed.

Mr. McDonald.—Dr. Babcock has demonstrated that the butter globules do not contain any caseine. In order to prove this he takes the globules of butter fat and divides them by a certain process and they resume their globular shape again. This has been a subject of investigation for many years. German scientists have accepted this theory. But it is too soon to philosophize. If you want good butter the less change you make in the temperature the better. Separate, at the temperature it comes from the cow, with the centrifugal process, cool it down gradually to 38°, keep it as near that as possible and you get butter of the right quality.

Mr. Sprague.—We are only practical butter-makers. We want to make butter that will sell and bring the best prices. I think we want to come down to practical business. The butter tub question is another question that we want to take up soon. We have many implements that we use which we might discuss, such as the butter packer. There are three kinds of butter packers, the roller, lever, and power packers. I would like the experience of some makers as to which they preferred. We came here to get information.

Mr. Ramsay.—The opinion seems to be that we have done fair work in butter. We use the power packer, and a great many people imagine that butter should be worked a great deal in the packing. Now, the less butter is worked the better. It should be packed with as little working as possible. And if this is so there is no occasion of bringing in expensive butter-workers.

Mr. Graham.—I would like the experience of butter men on packing butter. My experience has been that when I put butter in tin lined tubs, covered it over with the salt and let it stand two or three minutes the butter has a lardy appearance on top. I would like some one here to explain the cause and the remedy.

The Chairman.—The subject will be up to-morrow in Mr. Robertson's paper.

Mr. Derbyshire.—Mr. Shaw has two papers—one on "Permanent Pastures," and the other on "Robbing the Land." As far as I am concerned I would like to hear the one on robbing the soil. I think it is the most important subject that we could touch upon.

A Member.—I believe there are a good many robbers of the soil, and I would like to hear of them.

Mr. Derbyshire.—I would like here to remind the members that any questions may be handed to the secretary and will be discussed to-morrow.

ROBBING THE LAND.

Mr. Thomas Shaw, editor of the Hamilton *Live Stock Journal*, read the following paper on this subject:

This grave offence against country and self, may be committed in a two-fold way, at once positive and negative. The former consists in taking away from the land its rightful due, and the latter in withholding the same from it, and the effects in either case are baneful. When the elements of plant food are taken away from the soil without being restored in some other form it is robbed, as in continuous cropping and marketing of the grain or fodder; and when the elements of fertility are allowed to waste, as in the leaching of manure, it is also robbed. In no instance has this ever been done since the dawn of creation without some person having to pay a heavy penalty exacted by indignant nature.

Certain elements of plant food as nitrogen, phosphorus and potash, have been committed to the soil by a beneficent Creator, in most places in a bountiful but not in an unlimited degree. Every crop grown upon a given area is a drain upon this fund, and when the amount of this plant food removed is not given back in equal quantity in some other form, it will surely in time be exhausted, just as surely as a bank fund will come to

an end when there are repeated drafts without any fresh deposits, hence, when lands are repeatedly shown with only a scant return made to them, but one result must be looked for eventually, and that is a most hopeless sterility.

The truth of this position is so apparent that it scarcely needs demonstration. A little child knows perfectly that where ten apples are his property and one of them is eaten every day, in ten days they will all be gone, but that if on each successive day he puts back another as good as the one removed, at the end of the ten days he will be just where he started. So, if a given area has plant food just sufficient for ten successive crops, and these are grown one after another, in ten years the supply is gone, but if each year, or indeed at irregular periods, an equal amount were given back, the land at the end of the ten years will just be where it was at the outset, neither richer nor poorer.

To expect exhausted soils to renovate themselves is a vain hope unless it be through the rest of long years, and the accumulations which an increasing vegetation always gathers. The restoration of fertility is never by miracle, for since that eventful day when the sons of the morning looked down from the ancient hills of immortality upon a new born world, not one material particle has been added to our earth, fully equipped for a voyage through the fields of space, till time shall be no more. So that to expect potash to be replaced without giving nature time to do it, or replacing it in some other way, is a delusive hope.

That lands may be sustained in undiminished fertility is made very clear by the processes of nature. We can readily conceive that American Savannas are vastly more fruitful than at the commencement of our era, and simply through the accumulation of plant food grown upon the soil which enabled it more and more liberally to feed itself. The North American forests tell the same tale. The annual self-enrichment given to themselves and by themselves every autumn, continuously increased the capabilities of the soil, so that each successive generation of young trees came into existence under conditions more favourable to vigorous growth than the preceding.

But the reckless hand of man appeared upon the scene and soon all was changed. In a single generation many of our farms have been so ruthlessly plundered of the accumulations of long centuries, that the soil which would sustain an oak that could defy a thousand tempests, will not now sustain a stalk of wheat in a July breeze, if indeed it produce it. What has been done by the hand of nature unaided, can surely be done by nature with the aid of man, so that when man appears upon the scene, instead of an ever-increasing deterioration of the soil, culminating in barrenness, as is so often the case, the process should be reversed, and there should be instead a constant process of enrichment going on.

We are not sure that the past of any country affords an illustration of this, which, instead of dislodging us from the position assumed, brings an awful charge against the prodigality of the race. Britain, perhaps, makes the nearest approach, but we are by no means sure that Britain, under the rule of Queen Victoria, contains a larger store of the elements of fertility than under the rule of Julius Cæsar. Yet it need not be so, as Britain with all her importations of artificial manures, throws vastly more of the elements of plant food into the Atlantic every year than are borne to her shores by the ships of nations, and dug from the bowels of the earth by her miners.

There is nothing, perhaps, of which men are so prodigal as of the elements of fertility. That hideous excrescence on the society of the country, the miserly farmer, so penurious it may be that he will not drop a copper into the collection box on Sabbath, allows his manurial resources in many instances to have their richness extracted by the winds, washed out by the rains, or devoured by that ravenous self-destroyer fire-fang, the unsatiable appetite of which is only appeased when the elements of plant food are gone. Men who would chafe over the loss of a lamb or a bird will allow streams of fertility to run away without any regard or concern.

Robbing the soil of the elements of her fertility is the greatest physical calamity that can come upon an agricultural country, worse than war, for after the frightful devastation of the battle-field, a patient peasantry in a fruitful country can soon remove every trace of its destructiveness. Worse than pestilence, for other people can build happy homes upon the graves of a decimated population. Worse than the earthquake and the

tornado, for the pathway of destruction may soon be reclothed, even by singing forests rejoicing in the rocking of the breezes. Worse than ignorance brooding over the land like a dark cloud, for aggressive influence from abroad may dispel this; and worse than the most scandalous misgovernment, for, from the death-throes of its latter end, the birth of complete renovation may be realized.

But once rob a country of its fertility and it becomes a desert. The old school definition for a desert ran thus: "A desert is a large tract of land or rock where nothing will grow," but with all due respect to Professor Morse, the compiler of that book, we hold the definition as very incomplete, as a desert need not be large, nor need it of necessity be composed of sand or rock. We think if the old man had said a desert is a piece of country destitute of vegetation, his definition would have been at once more complete and comprehensive. Gauged at this standard it is quite possible to make a desert of ordinary clay, or even of the alluvial deposit of river-beds. Any one who looks upon our language as extravagant, has but to visit the wastes of Carolina and others of the Southern States, where hundreds upon hundreds of acres of soil, where the negro once "toiled amid the cotton and the cane" are now completely abandoned, as, through long years of successive robbery, they have become so sterile as to be considered unfit for cultivation.

Once cripple the productiveness of an agricultural country and you strike a severe blow at her prosperity, you tap the fountains of her great strength. The degree of the productiveness of her soil is the great tidal wave which floats the ship or leaves it on the strand. With manufactures it is different, for so long as the mountain torrent turns the wheel and there is an outlet for the goods, it matters not whether the hills contain stone or rock, but when the resources of the soil are the chief sources of strength, it becomes both the statesman and the peasant, each to do his utmost to retain the elements of plant food in the soil.

But who have robbed our country of the elements of its fertility? Every one, we answer engaged in the tilling of the soil. If an edict of banishment were pronounced on all who are guilty here, the land would return to its primeval wildness. The beaver might again build his dam on the silent stream in the meadow, and the wild fox dig his hole unscared. This may seem too sweeping a charge, but "things are not always what they seem." Who, we ask has not allowed some of his manurial resources to go to waste? Who does not allow some of the fatness of his soil to flow adown the streams in autumn and in spring time; from lack of under-draining? and who has made the most of the bones that pave the pathway to his kennel, or of the contents of the cesspool with its concentration of the elements of growth.

But the offence here is one of degree; while some have sinned gently, scarcely chargeable with guilt, others have sinned greatly. They have fleeced and robbed and starved the soil that fed them, till, in its enfeebled condition, it cannot produce even half a crop, and yet uncomplaining nature, with a generosity that never fails, does what it can still to reward the efforts of its short-sighted oppressors. A motley crowd of offenders we have arraigned at this bar. The rank and file are sturdy yeomen, but amongst them are professional men and even legislators. Read to them the strong indictment charged with robbing the country of the elements of fertility, and of this crippling its resources. Pronounce the stern sentence, every word of which is just—because ye have done this the land is cursed and will not henceforth respond but feebly to your labours, therefore ye "shall spend your strength for naught and your labour for that which is not bread."

In what way has the land been robbed? In many ways. The sins here have been those of omission as much as those of commission; of the former class is that indifference which allows the muck where now the cattle are prone to mire, to lie amid its watery saturation instead of draining it and putting a share of it on upland soils. Of the same class is all waste in the handling of manures, whether in the solid or the liquid state, and indeed the allowing of any material on the place in the shape of plant food to go to waste that will more than repay the handling of the latter class, is the growing of coarse grains and selling them off the farms, or even of wheat in undue degree. A woeful mistake it is, which cannot be practiced long in any country without a retributive punishment being meted out. The return in such a case will be on the descending scale, until the farmer who follows it must abandon the lands which have helped to make him rich—a legacy to

some successor whose life will be one long struggle with the unproductiveness of a plundered soil. A very important feature connected with this spoliation system in the past is this: that it has clothed itself in a magnificent garb which, more than the deceitful mirage of the desert, deceives the would-be yeomen travellers by its false glitter. Men have grown rich by the process, and they have been set down in the estimate of onlookers as successful farmers, while the truth is those men grew rich by the energy with which they reaped and sold the crops of other years, produced for them by deposits that were being made in the soil when Columbus was searching for another world. The sons of many of those men are now to be found in the valley of the Saskatchewan, or what is more to be regretted, behind the counters of the dry goods man and the grocer. They say "the old homestead has lost its charms, the seasons have become so unfavourable of late that they cannot do more than make a living," hence the desertion of that old homestead and the snapping of the cord that moored them to the dearest spot on earth. What is successful farming? Ordinarily it is considered to be making money on the farm, without any regard to the nature of the process or methods. This definition so universally accepted is most illusive. A money-making farmer may be at the same time a land robber. Some of these experts have done their work of ruin in one place and then moved away to do it again in another. These men are systematic robbers of the soil. We freely admit that they may have been good neigbours with many estimable qualities, but we deny that they have been good citizens in every sense of the term, and this paper will have done good work, if it only expose this delusion as to what constitutes a successful farmer. The fleecer of the soil has been assisted in his success as stated in another form, by the catering of the elements of forgotten ages, and he hands down a legacy—a robbed farm to a successor, whose efforts during the whole of life will not undo the work of spoliation that he has accomplished. The idler who allows his lands to lie a common is in a sense a better citizen than the land-spoiler, for he is at least allowing its producing capacity to remain unimpaired. If the grain grown on such farms were not exported, the loss to the country might not be so great, but we know that a great part of it is.

We must therefore fling down this common acceptation of the definition of a successful farmer from the pedestal on which it has long stood, and replace it by a true one. A successful farmer is one who has made money at his business, leaving his lands at the same time, at least as fertile as he found them.

Tried by this measure, how many successful farmers have we? They would form a less numerous regiment than that of the giants of the Prussian king, and yet we have some of this class and what is most encouraging, the number is rapidly increasing. Yet, be it remembered, no one growing grain exclusively, remote from town or city, can enrol his name here. This corps is recruited from the ranks of the stockmen, and although the standard of requirement is not severe, the grain-grower cannot come up to it.

Exporting grain may be a source of gain in the meantime, but what of the results? In the many millions of bushels of coarse grains exported last year, how much of the elements of plant food sent across the sea never to come again? One could almost wish that the wheels of the exporting ships would crash one after another, if there were no other way of mending this practice, which reacts so ruinously on the productiveness of our country. And what mean those men who are selling store cattle to be finished in other lands, and who send after them the grain to fatten them there? Let Mr. Moreton Frewen send over his Wyoming stores if he can get an outlet for them, but ours we want at home. Though he is anxious to send Wyoming plant-food to Britain, there is no reason why we should desire to send Canadian. We have read somewhere, that once upon a time, the goose that laid the golden egg was slain by her avaricious owner, but comparing this act with that of the sellers of store cattle, we fear he has an abundant following in Ontario. Cattlemen of Canada, keep those stores at home. Canadian phosphates and Canadian potash are required quite as much in Canada as in Britain.

We shall now say a word as to the method of sustaining fertility in our soils. We have already said that we think the fertility of a country may be sustained, and we add here, without the importation of manures. Nature in unoccupied countries has taught us this lesson. There is in these an accumulation of fertility, where the increase in quantity comes from, we do not now stay to enquire, but the fact just referred to makes it plain

to us, that the store of plant-food may be increased, rather than lessened. If nature can, unaided, recruit her productive resources, and also increase them, without the aid of hidden stores locked up in the bosom of the earth, why may not nature aided by the hand of man, who, in addition to the husbanding aright of the products of nature, can add to her resources by unlocking those buried stores and utilizing them as plant-food, and all the more so where a filter is made in the form of under-drains, to retain the fertilizing elements in rain-water and in the air which it contains; were it otherwise the outlook for the future of the world would be grave indeed. Its growing populations would some day have to face short supplies, and to be put on an insufficient ration, the product of lands less and less productive. But with the inherent power in nature to increase her stores, if man is only true himself, this realization would not be feared. Various methods may be adopted either singly or in conjunction; usually the latter course will prove the most efficacious. By it we mean having recourse to the growing of green crops to be ploughed under, drawing muck where open ditches are required to the highlands, locating a compost heap where the odds and ends of manurial resources usually are wasted, and keeping constant vigil over barn-yard manures lest these leech away, or waste their richness in the expansive air.

The great fertilizing resource of the Canadian farmer in the meantime, is barn-yard manure. Science has demonstrated what practice in ten thousand instances confirmed, that barn-yard manure adapts its properties to every form of climate and soil where grains grow, more readily than by other fertilizers, and indeed that it contains the elements of plant-food more perfectly blended. So important a factor is this of the farmers' raw material, that it outweighs every other. The prosperity of the country is so dependent upon the use that is made of this one item, that the man who can persuade his fellow-farmers—all of them—to make the most of it, would be its benefactor and worthy of the highest honours it could bestow upon him. The land is robbed here in a two-fold way—first in the almost universal waste in degree, of the barn-yard manure that is allowed, and second in the small quantity made in comparison with what this might and ought to be. The farmer should first get the attention of the husbandman. The leak of urine in the stable floor should be stopped and the waste in the barn-yard of its precious liquids. Its volatile treasures should be retained by plaster or earth thrown over its outer surface, or, better still, by its early burial in the soil, in which case in most soils its treasures are most securely conserved. This done, the farmer may turn his attention to the manufacture of more manure. A great advance is made where all the fodder is fed upon the farm, and all the coarse grains too. The great matter is not the quantity of manure made so much as the quality, and herein it is that the fruits of feeding grain are most bountifully reaped. A straw-stack may be thrown down into the yard, and through the medium of rains and cattle hoofs, but principally the former it is turned into manure. It is scarcely worthy of the name; were it used as litter for cattle in sufficient quantity to absorb the urine, its worth would be increased many fold. The quantity of the barn-yard manure may be increased by stocking the land to its full capacity; soiling either partial or absolute, will build up the pile higher. The future of this adjunct to successful farming is still in its infancy, yet we believe that its adoption in one farm or another will be almost universal, when men get tired of the folly of keeping their farms fenced in ten-acre fields. To render this method of increasing the manure heap of universal adoption, the stock fed must also be raised upon the farm. Some men, shrewd in their day, have kept their less wide-awake neighbours raising store cattle for them, which has built up one section and added to its fertility at the expense of the other. But are no artificial fertilizers to be used? By some men perhaps, but as yet these are few. We shall take it upon ourselves to say who should not use them. No man should buy these whose practice allows the manurial resources of the farm to go to waste, or who does not try to make the most of them. Ashes filtering in the rains will give a better return for their application than purchased phosphates or guanos. It is very thoughtless to say the best of it, that men will encourage the ransacking of the clefts of Peruvian rocks, and the burial place of unnumbered generations of Carolina bats for sources of enrichments, when they can get them in better form and at far less cost, in the utilizing of what had been misused in their former practice. Nor should farmers purchase those artificial manures till they

know where to apply them other than in a tentative way. Rich men can afford to pay the price of their misapplication, but not the rank and file of Canadian farmers. We are not decrying the worth of artificial manures. They have their place and an important one it is, and their day in Canada is coming. We have vast beds of mineral manures within our borders, and some day the earth will be honey-combed in search of them, but in the meantime we are convinced that it is not wise for men to cut the earth in channels in search of manures, who are allowing them in other forms to run away over the surface. The evils that flow from robbing the soil are many and vexatious. Our farmers may feel indignant to be told that the practice of the major portion of them is necessitating a waste of nearly one-third of the labour expended in growing grains, yet we hold it is true. All will admit that the average per acre may be increased at least one-third, by a right system of tillage. Now the principal difference in the labour consists in the handling of the additional return, which is trifling. So that an impoverished soil is the greatest waster of labour in any country. Say that one-fourth of the labour expended in grain growing is lost instead of one-third, what an enormous waste for Ontario has 200,000 farmers.

Then there is a corresponding waste of capital. The same implements are required to work a fleeced farm as a rich one, and the same amount at least of horse labour. In the aggregate the waste here is very great, for Ontario has 311,587 head of working horses, exclusive of breeding mares and the money invested in implements is no less than $48,569,725 or nearly one-twelfth of what is invested in the soil itself. The diminished and constantly diminishing revenues of the farm that has thus been shown, are also serious, while the man who feeds his land well is in the position of one who is annually increasing his deposits, and also adding the interest. He who adopts the opposite course is like one who makes repeated draughts upon the deposits until they dwindle into insignificance. But, says one, have, "not many made money in this way?" They have, but they cannot do it in the same way again on the same lands. Robbing the land has the further tendency of producing discontent amongst the young men of the farm, with the calling of their fathers. The result is self-expatriation in unnumbered instances. It is discouraging under any circumstances to toil without return, but particularly so on the farm, where the toil is by necessity laborious. When young men see that they can make money they are usually willing to fling their energies into the thickest of the fray, but where these are not forthcoming, as they cannot be on worn-out farms, it is most disheartening on such a barren altar to sacrifice the glowing aspirations of life's early prime. Worn out farms have driven more young men away to the seclusion of the city, than the glitter of her attractions has drawn. They are stronger to repel than a mother's love is to draw, and this is saying a great deal. They have shriveled the pocket and bent the shoulders and soured the temper of many a promising yeoman. They have hollowed the cheek and broken the spirit of his patient wife, and they have kept at the plough and in the kitchen the young man and the maiden, who might have shown at the university and the college. But it is on the wealth of the country in the aggregate that they have told most heavily. Mr. A. Blue, of the Bureau of Industries, has told us many things regarding our material condition as a country, but one thing he has not yet told us, and that is, how much poorer our province is to-day then it would have been under a proper system of tillage. No statistician has ever told us how much Canadian plant-food has been washed out into the Atlantic, nor how much exactly has been sent abroad to distant climes, nor how much has been allowed to go who knows where, in an atmosphere surcharged with Canadian ammonia.

Farmers of Ontario, I am glad that I am yet alive to raise my voice against this spoliation of my country. Henceforth I will consider it a part of my life-mission to stay the enormous evil both with tongue and pen, and I call upon every lover of his country to join in the crusade. If the Premier of Ontario and her legislators could but persuade the robbers of our lands and theirs to stay their hand, what a grand work would they accomplish! More advantageous, as we deem it, then will prove all the legislation of the next decade. We are blessed with a splendid country, far above that of many of earth's inhabitants. Our skies are sunny and our atmosphere most bracing, our soils are or were rich, and our rivers pure, our slaughtered forests will in a measure spring up to resurrec-

tion life, and our herds may still continue to be the envy of many lands; but what will this avail if the best of our sons are banished and our producing resources crippled, by the systematic removal year after year of the richness of our lands?

Mr. Derbyshire.—I have been delighted with the able paper which Mr. Shaw has read to us. The butter that we have been talking about can't be produced unless we have the plant food in the land. This matter must be looked into more carefully than it has been in the past; millions of money have been allowed to run away in our rivers and streams. Thousands of our best young men have gone to the States and other countries to look for the fertile land which we have here if our manures are looked after. I am satisfied that the great richness of the future of our country depends upon the careful management of our resources in this direction. Any one who has looked into this business in the past can easily see the difference in any crop, provided that it has plenty of manure to enrich the soil. I believe that it is the greatest mistake that we make at the present time, that of trying to do too much and not half doing it. Thousands of acres of land are worked, from which we don't receive half what we ought. I look upon this paper as the most valuable paper that could be introduced at this convention, because it will set our farmers to thinking of this robbing of the land. We want to stop the leak in the stable floor so that the liquid manure is taken care of and properly placed upon the land, and in a few years we will see the difference in the yield of milk. It is a discredit to this province that in Ontario, which is so beautifully situated, with such advantages of climate and natural fertility, we find that only 2,700 pounds of milk is the quantity we produce on the average, while 4,000 pounds has been produced on the average where the soil has been properly looked after, and even as high as 6,000 pounds has been produced. We should feed all our grain to the stock and see that the product is returned to the soil. These are subjects on which I feel very warm; the proper care and husbanding of our manurial resources is the most important thing we could talk about for an hour or so anyway. I think manure should be sheltered. Now, we see it too often thrown out of the back window of the stable, thrown out where the water from the eaves drips on to it, and when it is applied to the land it is not worth half what it would have been had it been properly cared for. That is the first thing we fail in; we don't house our manure. See that the black stuff don't go to waste, which too often is found running off to the rivers. The consequence is that we lose half the value of our manures. See the difference in the look of a hill of corn that has had manure. It doesn't dry up and wither in June if you put a shovelful of manure on it. Some have discussed the advisability of taking manure out in the winter time, straight to the field from the stables. Get it done then. That is when the farmers have the time, in the winter. It will give the boys something to do, and keep them from talking about their neighbours. But the idea I am trying to convey is, if you don't haul it straight to the field, keep it under shelter every winter. Get it on the field in the spring of the year, and put every bit of it on a field of corn. (Laughter.) Corn is the best fodder we have. It furnishes the best quality of milk, and gives the biggest quantity. Plant it three feet apart and manure heavily. As soon as your pastures get dry, cut a little of this and feed it to your cattle. You will see them look right up and smile. No tears in their eyes then. (Laughter.) And when it comes the proper time slip off the corn and put in fall wheat, and you will have such an answer that you can sow two crops—Professor Brown's grass or brother Graham's plan. And I believe clover is something that we should put into the land. Do this and you will have a fertility that will surprise you. It would pay off our national debt in four years, (laughter,) and we wouldn't have to discuss it on the public platforms. We would have no more use for the politicians. (Laughter.)

Mr. Moyer.—We can congratulate ourselves that we know who are the land robbers. I am sure I will do all in my power to talk this matter up with the farmers, as I am trying to talk up this butter business. It is a vital consideration as regards their land that most

of the product goes back to the soil again. I have also been telling them that by the introduction of the butter factories they will save the women so much labour, and keep the girls on the farm, and the boys will then stay there too.

A Voice.—The neighbour boys. (Laughter.)

Mr. Moyer.—I would again say that I am very much pleased with the paper which Mr. Shaw has read, and I would also say a word about the way my father used to keep his manure thirty years ago. He kept it all under a shed—kept it out of the rain. The neighbours laughed, but he did it, and I am very glad now to learn that his idea was correct. That was his idea. He was a man of few words, but he stuck to that course as long as he was a farmer.

Mr. Graham.—There's one point which has not been brought out. There is no doubt we rob the soil, but one system that would stop the whole thing would be winter-dairying. In the winter four-fifths of the cows are kept on straw for over six months in the year, and this means idle capital.

Mr. Derbyshire.—Standing up against a wire fence. (Laughter.)

Mr. Graham.—To my mind, winter-dairying will pay better than summer, and I am now building a factory to run all winter and the neighbours in our section are going with me. If we can make it pay it will keep our men employed all the time, and I say we will be doing a grand thing for the country. Three-quarters of the farmers and their hands are idle nearly all winter, and I say that if we can get these men profitable employment during that time, we will be doing a grand thing for the country. And if we sell our produce at high rates, at market prices which are then high, and have the manure to put on the land we will be doing another grand thing. I am quite satisfied that winter milk can be produced at a cent a pound, and that it can be profitably manufactured into butter and cheese. If we can get ten months' labour out of our cattle instead of six it would be conferring a great boon upon the country.

Mr. Sprague.—The present method is not as profitable as it should be. The practice of milking a cow six months and letting her lean up against a wire fence for the other six months is a bad one. We are calculating to run our creamery for ten months at the very least. Following up the suggestion already made by Mr. Graham, we find that we have at present in the months of May, June and July, a great quantity of milk and very low prices, and at the time when we have the good prices we haven't got the butter to bring to market. The better class of our customers require fresh made butter during the winter. We had better make it when they want it. There will, of course, have to be a change in the calving. That is the man, say, who keeps twenty cows will have to arrange so that one-half will come in in the spring, and the other half in the fall, and pursue that method. In August, when the weather is trying and the flies are thick, we let our cattle get fat. That is what our people are taking up, and they are going to do it too. Rich soils are becoming exhausted, the price of grain is down, and we cannot compete with the west in that respect. We cannot raise wheat as cheap as they can in Manitoba. The only thing we have left is to change our mode of farming and adopt a mode similar to that spoken of by Mr. Graham. In comparing the winter dairying with the summer, we must remember that the winter is the idle time on the farm, when our labouring men want work and are out of employment, and we can give them employment at home all winter. It is costing us very little more for proper feeding to put our stock through the winter in good condition than it would to put them through just keeping them alive. You can cheat a store-keeper out of his honest dues, but you can't cheat a cow. If you cheat her out of beef in the winter she is going to take it back from you in the summer.

Mr. Ramsay.—This subject has been discussed in many places. Now that beef has become cheaper, the question is agitating the farmers whether it would not be better to have milch cows instead of beef cattle. Many maintain that the same amount of food fed to a milch cow and to a beef animal will produce a pound of butter in the one case and a pound of beef in the other. If the farmers were once convinced of this there would be a great change. In the western part of the province the principal business has been stock-raising for export, and the low price of beef at the present time is causing discussion to

see if it wouldn't pay to go into milk producing instead. It seems to be the general conclusion that it pays better to put money into cows than steers. If we can produce a pound of butter in the winter season as cheaply as a pound of beef, it would pay a great deal better, because the animal with the manure would be retained, while in the other case the animal is disposed of and gone. That is the stand that we occupy at the present time, and in our section I have found a good many who have come to this conclusion. Cannot we raise as good an animal at two years old with skim-milk? A good many in our section believe that as good an animal can be raised in this way as if it were allowed to suck the cow. Of course a great many will not admit it, because they never went to the trouble to try. The system of raising calves has been a very careless one. They have been fed with cold milk, which has never been warmed for them as it should. Many have been experimenting with warm milk and oil-meal, and with care and management have got as good a calf at six months as if it had sucked the sow. When the calf has been allowed to suck and is taken from the cow it is apt to go backward. Of course it takes time to convince people and get them out of the rut in which they have been moving.

Mr. Graham.—Mr. Derbyshire was speaking a while ago of 2,700 lbs. being the average weight of milk from a cow. I had the pleasure of testing a cow some time ago and she gave 20,000 lbs. of milk in ten months, and as much as 53½ lbs. of milk per day in the tenth month, October. In July her milk weighed 84 lbs. in twenty-four hours, and in January, 90 lbs. in twenty-four hours. I know that I have averaged as high as 5,900 lbs. of milk from forty cows for seven months. In regard to the winter dairying I said that I was quite satisfied that milk could be produced at a cent a pound. I started some time ago to find out. I started with twenty cows, and weighed the feed, the milk, and the butter each day, and it cost exactly nineteen cents for twenty pounds of milk, at fourteen pounds of hay, twelve of grain and thirty of roots, while hay was $19 a ton, and roots ten cents a bushel.

Mr. Moyer.—I think I saw a statement that it costs twice as much to feed a cow in the winter as in summer.

Mr. Sprague.—You have to feed the cow all winter anyway.

Mr. McDonald.—The more stock that is kept the more manure there will be, is one of the most absurd and preposterous ideas that can be imposed on the farmers. It is said that barn-yard manure contains all the elements of fertility, though very often it is more deleterious than beneficial. That principle is correct, provided the soil is altogether deficient in all the elements of fertility. Mr. Ramsay will tell you that the soil in his district is deficient in potash. I find that it is deficient in phosphates in my locality. I can render it fertile by phosphates, with half the expense that I can raise barn-yard manure. It has gone abroad over the country that it pays to have stock if you only get the manure as profit. That is a very dangerous doctrine to preach. We have heard tonight how much it costs to produce barn-yard manure. We must put up sheds to keep it from leeching, and all the rest of it. If you apply barn-yard manure to land that is deficient only in phosphates to make up that deficiency you must put on two or three times as much manure as the soil requires. Every farmer must study the first principles and must experiment on his own farm and find out what his soil is deficient in.

Mr. Ramsay.—In my section they feed their cows all winter and keep them up. What I claim is that if you feed the same quantity to a cow that you feed to a steer it will pay you better, but no definite rule can be laid down as to the cultivation of the land, because the farmer has to be guided by the nature of his soil.

Mr. Rivers (Walkerton).—I would like to ask this question: About what is the average cash return for each milch cow for dairy produce?

Mr. Derbyshire.—If you take the standard for the province of Ontario it is about $20. That is what we have been producing. Of course we have, as at present, managed a very short season, about five months.

Mr. Rivers.—I keep thoroughbreds and grades. I don't raise my grade calves by hand. We have, for several seasons, gone from $30 to $40 of clear profit from every

cow. Now, we have heard a great deal on the subject of turning all our beef cattle into milch cows, but where is the gain?

The CHAIRMAN.—Do you let your cattle run to the straw stacks?

Mr. RIVERS.—No.

Mr. DERBYSHIRE.—We have farmers in our section who have made $60 profit on a cow. I suppose we have twenty different farmers that have made this much. That would be a proper yield of milk. But the statistics show that the average yield is only 2,700 pounds of milk per cow per annum. The statement was made by Mr. Blue, of the Ontario Bureau of Statistics, and, of course, these figures are correct; but if a farmer wants to be rich and happy and live to a good, ripe old age, he will not have a cow that can't make more money than that. It is a mistake for him to do it. (Laughter).

Mr. MOYER.—You could easily understand the low average if you went through the country and looked at the cows in the barn-yards everywhere, shivering and hugging the straw-stack.

The discussion then closed and the Convention adjourned for the day.

SECOND DAY'S SESSION.

The second day's session was opened by the President at 9.30 a.m. In doing so Mr. Hannah said: It is the wish of Professor Robertson that the Association should appoint a committee to go to Guelph and inspect some butter which has been prepared with different kinds of salt.

Mr. J. T. Brill, of Guelph, moved, seconded by Mr. Derbyshire, that Messrs. James Park, Toronto; Thomas Johnson, Toronto; and F. W. Fearman, Hamilton, be such committee.—Carried.

COMMITTEES.

Mr. DERBYSHIRE.—The election of officers will take place the first thing after dinner. It would be wise to appoint a nominating committee. I move that Mr. Brill, Mr. Sprague and the mover be that committee.

Mr. CHEESMAN seconded the motion, which was put and carried.

Mr. BRILL.—It would be in order for some one to nominate a committee to wait upon the Government in regard to our government grant and other matters.

Mr. DERBYSHIRE.—To save time the nominating committee might nominate that committee.

The PRESIDENT.—It would be well not to nominate them until the president and other officers are elected.

Mr. DERBYSHIRE's suggestion was adopted.

The PRESIDENT stated that he had received a telegram from Mr. Fuller, of Hamilton, expressing his regret that he could not be present at the meeting. The appointment of an instructor by this Association to go amongst the farmers had been talked of. Perhaps that might be discussed to-night.

Mr. SPRAGUE.—I don't think the convention should adjourn until it has appointed an instructor in butter-making.

Mr. BRILL.—I would move that there be an instructor appointed by this Association to visit the factories and instruct makers in the best processes. I am very sorry Prof. Robertson is giving up his position. If he had remained, with some competent men

under him, it would have been a good thing for the trade. The instructor could visit each factory two or three times and so cover twenty-four during the season. He could easily go twice during the season and still have time to deliver a series of lectures.

Mr. SPRAGUE.—I second the motion. With regard to the abilities of the instructor, I presume we will have to be guided by the butter buyers; they would have a better idea of what is required. We want the best instructor we can get, whether a lady or gentleman. In the middle of the season we are all busy and cannot give attention to these matters as well as in the winter season. The first question is, "Have we the means to employ an instructor?" After that we can attend to the selection of a suitable person, and in this we will have to be guided by the butter buyers.

The PRESIDENT.—Put the resolution in the shape of authorizing the directors to appoint an instructor. The motion should only affirm the principle of appointing an instructor.

Mr. BRILL.—That is all I want to express by the motion.

Mr. DERBYSHIRE.—The resolution is all right. If we only have $50 to spend in that direction, we want an instructor. I think that the proper plan is to carry the resolution now before the convention, and then see about our ability to obtain more funds, if we have not sufficient now to carry this work through. In the winter time the instructor could lecture in connection with this institution and farmers' institutes. Another winter, if our business extends as we hope and the farmers to turn out in large numbers and support us with their influence and contributions, as they must if we are going to succeed in this undertaking, we will not fail in our business.

The motion was then put to the meeting and carried.

THE DAIRY COW AND HOW TO FEED HER.

On this subject Mr. Derbyshire read the following paper:

My subject is the "Points of a Dairy Cow and how to feed her." I believe that it is one of the subjects that have been more discussed probably than any other that can be brought before this Association. We have read all the wrangling and discussions which have taken place in the press on the subject. The salt men don't appear to be anywhere in comparison with the dairy cow question, and of course we have to look out what we say. There are "points" in the dairy cow as there are in the horse and other animals. We want to come to a conclusion as to what our business is. If we are butter-makers we want to select a cow for that purpose. If we are stock raisers, we want to select cattle which will put on beef. I am one of those who believe that we can never have a general purpose cow in the world. You can easily understand that a draught horse is not one that is suitable for racing purposes. A cow that is a large milker is not one that is suitable for beef. I may state briefly the points that we have to observe in selecting a dairy cow. I think the first essential is plenty of room for brain; next, a large, prominent, bright eye; I think this is a great essential. The nose should be thin, she should have a broad muzzle with large, fine, dilating nostrils, showing her to be a good feeder and a large consumer of oxygen. She should have a long lean face, the same as a race horse, deep and broad through the body behind the shoulders, shoulders sharp; round, broad and full brisket, showing large size of lungs; broad hips, and straight back, giving the characteristic wedge-shaped short body and showing good digestive qualities. No cow will last that is hollow backed; flat hind legs, in sloping hams, giving plenty of room for large udder attachment with long line of absorption carried well forward, giving plenty of storage room. She should have a thin elastic skin, mild temperament, neck tapering fine, not fleshy, strong joinage of spine and head, and plenty of nervous activity. You have combined in these characteristics the best kind of a cow. The way to get this cow is by the careful selection of the best and always sending the poorer ones to the block or

market. There is no way we can get at these things in a short time; it wants years of experience. There is no loss in slaughtering a cow that gives 3,000 lbs. of milk if you have a nice young heifer that's going to give 4,000 lbs. the first year. The selection of a cow is as necessary as the selection of a horse. Looking at the speed which race-horses have been brought to by selection in breeding, we find it is simply marvellous, and it is just the same with milk. You hear Mr. Graham talk about 20,000 lbs. of milk from one cow in ten months; of course all these things are worth considering. I don't believe we can make any such quantity of milk, but I do think that we can improve the yield very largely once the right system is commenced and our native cows are bred to selected male sires of a known milking family. Breed carefully and raise those which prove to be good milkers, and only then will we be able to get an ideal cow. It is the greatest mistake possible keeping say ten cows and four of them strippers. The four are robbing the rest. That is the average plan in the country. I think that if we were to weed such cattle out of our herds it would be a good thing for the country. This is enough on that question to introduce the subject.

Now we have the cow we want to commence to feed. The first thing of course, is to assume that we have a warm, comfortable, well ventilated stable, though in our locality we have men who are not even in favour of this. They think a cow cannot be hardy unless she is half frozen all the time. But she can get plenty of pure air in a properly constructed stable and at the same time be not chilled. Any man who has not got that and is running a dairy to make money is making a mistake. He is going to get left sure. A good temperature in a properly ventilated stable is the right place for a cow to live. The first thing in feed is to have plenty of good nutritious food of the best kind, to vary the feed according to the seasons of the year. A great many have the idea that in order to have a cow healthy she has to stand outside against a wire fence all winter. That is another great mistake. We can have a healthy cow that is never let out of the stable till spring. In our locality many farmers think that a cow has to be turned out to drink, to go down to her knees in that humiliating position (laughter), up to her belly in the water to drink. A cow is just a machine for turning food into milk, and of course we want the most perfect machine and run it in the most perfect way in order to have the best results. I think it is necessary at all times that a cow should have plenty of pure water—all that she will drink. I had the great privilege of listening to Prof. Robertson on one occasion when he showed the difference in cattle that received water warmed, in the yield of milk, as compared with the yield from the same cows when given the water cold.

In the summer we want plenty of good grass. It is the natural food for the cow, and she should have it without having to travel for it. I don't believe a cow should travel thirty-five miles to get a living scrambling over rocks and stones (laughter) without a minute to lie down or rest and digest her food. We would not like this kind of thing ourselves. Her food should be palatable; I think, further, that we might do a great deal with bran in the summer time. Our farmers don't fully appreciate the idea of bran, and the good it will do in feeding a cow. It is very cheap, and there is nothing like having something nice for the cow when she comes home. Then she will come herself. It will bring her home without a dog. I remember hearing the Hon. Lewis Harris speak in regard to the principle of love in dealing with cattle, and he told how he made a cow love him. When he stepped into the barnyard she walked right up to him smiling. I have been in barnyards where the cows when they saw people coming dropped their tails between their legs and ran off for all they were worth. You can see the temperament of the man you are dealing with reflected in the actions of the cattle in his barnyard. I have gone in to buy cheese and have stepped into barnyards only to see the cattle scud off with all the vigour they had in their emaciated bodies. I don't know whether it was at the sight of me or not (laughter). It is a fine thing to have the cow love you, walk to the stable herself, and walk right into her own stall; and a little bran during the time she is having grass in the summer will help to bring this about. You have no idea of the difference that it will make in the quantity of milk you will get, and the manure that we receive from the droppings will more than pay for the extra cost if it is preserved and housed.

The cow will require more heavy food in the fall and winter—grain and mixed feeds of that kind; they are best ground up, mixed in small quantities and so fed. Every day we should have something different to give the cow—a little extra, a little nick-nack. Salt is what a cow loves. Not any salty rock which she licks till the tears run down her cheeks, but just a handful of salt in the corner of the feed box. It will be all she wants, and the cost will be comparatively little. In the spring we want bran and oats. Of course grass is the natural food and the cheapest food for a cow in summer.

A most important matter is the care of the cow. If we expect to make money we must have the best machine at the start, and the points I have given will make the best cow of any breed. Selection will make the best cow for any purpose. We don't appreciate clover hay. It should be cut green and taken care of and not allowed to get as coarse as pea straw. We want something to keep up the milk flow, and green fodder is probably the best that can be given; with good clover and green fodder, well cured in winter, you have no idea of the quantity and quality of the milk you get. We can make money by running our business on business and scientific principles.

Prof. Robertson.—I regret very much that I was not able to be present with you sooner, as I would have known exactly what ground had been gone over, and so have been able to avoid repetitions which are always wearisome. I have been delighted with the way Mr. Derbyshire presented the points of the ideal cow. I shall not attempt to discuss butter-making, which I shall take up afterwards, but simply extend the discussion on the question of a profitable cow. She should be kept as a source of profit and not for ornament. The Canadian farmer wants a profit on his cows, on his feed, and even on his stables. She must have first the power of economically transmuting food into milk. She should be an animal that can consume a large amount of feed and convert it into the largest amount of milk, and one that does not lose much in the process. She must have lots of nerve power. Milk is made by the application of nerve force to the blood. She is to have a nervous system strongly organized. That is the direction in which all Mr. Derbyshire's remarks point. All those delicate lines and fineness in shape and form are indicative of that nervous nature that is essential in a good milk producer. You can have a cow turn feed into carbonic acid gas and let it go out of her lungs or through her skin; or you can have her change her feed into beef, but the dairyman does not want a cow to do either of these. If a cow be kept in a cold stable, then she gives off from her body a great deal of heat, in fact, she warms the atmosphere around her. It does not pay a farmer to warm his barnyard that way. (Laughter). And this applies not merely to winter. If she is kept warm and comfortable all winter, she will not waste so much food in the summer. The thoughts suggested by Mr. Derbyshire are most suitable, and are recognized by the best dairy farmers in this and other lands. When a cow is fed on food which is suitable and succulent, her milk is richer and more freely yielded. The farmer who feeds his cows on green fodder in the summer will get more milk, and get better milk. Milks from the same cows that were receiving no green feeds were tested against the milks that were given by cows which were receiving green feed. Two groups were tested, one being fed with, and the other without, and the cows that received green feed yielded much the finest quality of milk. Then the groups were changed and the same cows treated differently in each case, and again the result was in favour of the quality of those which received green feeds. And it is of further advantage because the habit is formed in the cow of giving a large amount of milk. If a cow is once allowed to shrink in her milk her owner loses by her lessened yield afterwards.

It is beyond a doubt that the salting of the cows affects the quality of the milk. You will find a statement in regard to these points in my report which is to be published inside of three weeks. The irregular and insufficient salting of cows has much to do with both quantity and quality of the milk; in fact, it brings about an immediate loss, it is estimated, of not less than fifteen per cent. in the quantity of the milk yielded, and renders it inferior in quality. If that is so, then the care of giving cows sufficient salt is one which the farmer can make more money out of than any other. The cost is a mere baga-

telle. The farmer does not recognize that fifteen per cent. of increase in the milk is the same to him as fifteen per cent. increase in the profit which a storekeeper has on an overcoat. Care and kindly treatment in milking are powerful factors in increasing the yield of milk, and improving its quality. Milk, being the product of nerve force applied to the blood, a cow should have good blood which means that she should have good feed, good air, and fine shelter. If a speaker becomes excited he can't say much. When a person unacquainted with public speaking gets on a platform, no matter how well he knows his subject, he is apt to stumble and lose his head.

Mr. DERBYSHIRE.—It catches him in the neck. (Laughter.)

Prof. ROBERTSON.—If you get a cow excited when she is being milked she will be unable to fulfil her functions, and will not let down her milk. A cow may be ready to yield a large quantity of milk, but if you excite her by ill treatment the flow is checked. So that kindliness to cows is a paying kind of action. I would direct your attention to the following points: (1) Feeding the cows on the best kind of food in the spring and on the best kind of food all summer; (2) allowing cows access to salt every day, giving them at least a quarter of a pound per day; (3) giving them the very best of treatment. The farmer should treat the cow just as he would a lady. The fact is, too many of them treat the ladies just as if they were cows. (Laughter.) This kind treatment is one of the most important factors in connection with milk production. The yielding of milk is a pleasure to the animal, and if she is kindly treated, she will give more milk. Tests and experiments have proved this, even in the case of our common cows. The profits of our business should come hereafter, not so much from getting higher prices for cheese and butter, but from lessening the cost of their production.

ENSILAGE FOR MILCH COWS.

Mr. SPRAGUE.—The general impression is that if you have strong grains you get rich cream. Green feed is what we want for milking-cows. Bran will aid the digestion and increase the cow's appetite for drink. The main thing which I want to discuss is ensilage. I have had my eye on it for some time, and would like to get some information on it. For winter feeding we want something to replace the nice green grass of June.

Prof. ROBERTSON.—My knowledge of ensilage feeding is rather limited, but any information I have been able to gather on the subject, leads to the conclusion that the feeding of stock with ensilage alone is on the whole not profitable, but that when it is fed in connection with other feeds the ensilage encourages to a greater consumption of dry food, and when fed with hay and chopped stuff it brings good results. The flavour is not so fine in the best volatile oils and there is a decidedly fermented flavour in the cream, milk and butter. I have not found that the butter from ensilage feeding will keep so long when the ensilage has fermented; but I have now a report of the British House of Commons on experiments made all over England. As yet I do not feel qualified to say whether Canadians can adopt it successfully, as the opinions of those who have tried it for years seem to be about equally divided on it. If hay be cut on the green side and saved properly I believe it may contain as much nourishment as if it were put in a silo. The loss hitherto has been that our hay does not yield as much per 1000 pounds as hay properly dried would per 500 lbs. The difficulty has been that that it has been allowed to become over ripe before being cut.

Mr. DERBYSHIRE.—I don't think we can handle ensilage without being prepared to go and have a bath every time as soon as we have done feeding. Did you ever feed it and come into the house and have your wife tell you to get out? (Laughter.) We had one in our neighborhood and the very air seemed tainted with it; a person's clothing smelled of it. I am satisfied that it flavours the milk. Of course some silos are more

perfect than others, and there may be some that are more successful than this one was, but it has not been a success with us. I believe that if the clover and other hay were cut green and care were taken not to begin to mow until after the dew has been dried off in the morning, we could save our hay and have a perfect feed and you would not have to take a bath as soon as you had done feeding. (Laughter).

Mr. SPRAGUE.—I am no advocate for the silo, but I want information. We want a larger quantity of feed, and cheap feed. I never smelled a silo. Speaking of the smell of a person's clothes, I know that some people have come into my store who smelled strongly of a cow stable, who never saw a silo. (Laughter.) In our section of the country we cannot raise roots profitably; that is why we take to the idea of a silo. My son visited York State last year for the purpose of examining their ensilage system there, and get information on the subject. He visited some large farmers and saw their system of growing silo corn, and he tells me that from one silo on the 25th of August last, they were feeding ensilage that had no bad smell and had been kept free from the air. His opinion was that it was a thing that was not to be fed exclusively, but in connection with other foods. We all know that we want different kinds of feed. It is of great consequence to a country that can't raise roots if ensilage will take the place of roots. On one farm that my son visited they had 300 acres of land, and the owner told him that before he adopted the ensilage system they could only keep forty-five head of cattle on it, whereas now he kept one hundred head. Now, I would like a discussion brought out on this subject. I presume that Mr. Cheesman knows more about this subject than I do.

Mr. CHEESMAN.—I would like to ask Prof. Robertson if he has had any experience of silos in Canada, or if he ever visited any of them in England? I understand, though Prof. Brown's former experiments with the silo at the Experimental Farm were not of a nature to recommend the ensilage system, that he has been so much pleased with the success of the system, as carried on in Wisconsin, that he is about to give it another trial. Those who hold on to it make sweet ensilage This is the case in New York and Vermont, as well as in the eastern townships and Montreal. Butter of a high grade is made from ensilage in those districts, and sold at from thirty to forty-five cents a pound. It is corn ensilage.

Prof. ROBERTSON.—I had the pleasure of examining 150 samples of ensilage during the competition at London, between the makers of the different kinds of ensilage, sweet and fermented. The ensilage which was on the sweet side had no unpleasant taste, but the other samples were simply in different stages of rottenness. Corn fodder is perhaps the most economical for fall, winter and early spring feeding. I have fed that fodder with as good results as could be obtained from any silo. Corn can be saved by stacking in the barnyard, and there is a strong opinion in favour of the great value of corn stocks in feeding.

Mr. CHEESMAN.—Fermentation is avoided in making sweet ensilage. It is not allowed to reach the alcoholic stage of decomposition.

Mr. GRAHAM.—I have had as good results from dry feed as from green, and even better. But it must be properly cured clover with pea and oatmeal mixed. From one cow I got ninety pounds of milk in one day in December. I have a number of grade cows which will give a dairy pail full of milk twice a day, living in the stable and being dry fed.

Mr. DERBYSHIRE.—Any one that cares about the feeding value of clover, will never commence to mow before the dew is off the ground. It should be cured carefully. Drive the machine over it and stir it up, commence and rake up into cocks about four o'clock, and let it stand twenty-four hours before putting it in the mow, and it will give a greater quantity of milk than you can get from anything except green fodder.

PRODUCTION AND HANDLING OF MILK ON THE FARM.

Mr. CHEESMAN then read the following paper by Mr. V. E. Fuller, of Hamilton, on the "Production and Handling of Milk on the Farm":

I have often claimed that a large proportion of the very inferior butter found on the market, is caused by the improper care of the milk and cream before it reaches the churn, and that if we wish to produce an A1 product that will command the highest price, we must assuredly see that the material out of which we intend to make our gilt-edge article is in the best possible condition to attain that end.

I premise in the first place that the dairyman who seeks to produce a superior product, is impressed with the fact that in handling milk, cream and butter, he has an article most delicate in its composition and most easily affected injuriously, unless he surrounds it with all the safeguards which experience teaches are necessary for its proper preservation in all its delicacy and sweetness. To attain this result involves an immensity of ever watchful carefulness, and without it the butter dairyman will assuredly be relegated to a secondary position.

Before deciding to engage in dairying, whether it be to produce milk for city consumption, for cheese or butter, decide in your own mind if your farm is suited for that purpose. Is it possessed of a living stream of good, pure water, or can you without too much expense, place within reach of your stock pure water untainted by any adjacent barnyard or manure pit? Is it a grass-producing farm, or can it be made one?

If you conclude that your farm is or can profitably be utilized as a dairy farm, the next point to decide is the breed of cows naturally adapted to that distinct branch of dairying you adopt. If for cheese, the largest flow of milk, rich in casein and fat. If for butter, the largest yield of cream of the best quality, containing the largest proportion of butter fat. In passing, permit me to say that a long continued experience in testing individual cows at Oaklands has taught us that there is nearly as great a variance in the amount of butter contained in a given quantity of cream from one cow as there is in the amount of cream contained in a given quantity of milk from different cows. No greater mistake can be made than to attempt to create a paying butter herd out of cows giving a large flow of milk rich in casein, but poor in butter fat; and he who attempts to build up a butter herd on this basis will find that he has builded in vain. Weed out your poor cows and those giving poor milk. Make each cow "stand on her own bottom" and do not rob the profits of a good butter cow to support a poor one: rather discard the poor ones and then having none but good butter cows, permit all to make their profits.

Having selected or bred your herd for your special line of dairying, feed them pure wholesome food, without waste. Too little feeding is waste, as you are carrying an animal at an annual cost of care, trouble and space, and yet you actually decline to furnish her with the material to repay her debt to you for such care and trouble; and once having allowed your cows to run down, it is far more expensive to restore the loss than to have retained them in condition. Who of us would not consider it barbarity to withhold from our children sufficient and proper food? And yet we too often are guilty of this folly and barbarity to our stock.

If we wish to form in our cow the habit of quantity and continuity in milking, we must between the first and second calvings exercise the utmost care to see that she is not only provided with the food to give the largest flow of best milk, but that the milking tendency is at this period fostered and encouraged by every reasonably available means. At this time in the life of the cow is this tendency fixed. Nature intended the cow to produce sufficient milk only to rear her offspring; the deep milking cow, and one that "holds to her milk" close up to the period of next calving has been created by the hand of man. If we allow our heifer to go dry early with her first and second calves we fix in her that undesirable trait, and one that is difficult to overcome, whereas proper care and vigilance at this period will assuredly fix the reverse. I contend that in a dairy herd the calf should not be allowed to have free access to her dam after the first seven days, as it will assuredly destroy her milking qualities.

Kindness to cows is one of the best paying investments around a dairy barn, and ill treatment is one of the most costly.

I think I hear some one remark "What has all this to do with the subject of your paper?" I have briefly touched upon these headings because—

(1). Without a proper dairy farm, stocked with sweet good herbage, giving to the cows pure wholesome food and watered with clean water, we cannot hope to obtain a pure sweet milk.

(2). Without the class of stock peculiarly adapted to that branch of dairying adopted by each of us, and unless we induce by proper management a good flow of milk from our cows, we will not long remain in the dairying business, nor will we be long interested in the question of how best to handle our milk.

I contend that to produce a pure wholesome milk we require (1) our cows to be in healthy condition; (2) our food and water to be be clean and pure; (3) our stables to be sweet, clean and well ventilated, and free from all impurities of atmosphere: (4) absolute cleanliness in the person of the milker and in udder of cows at time of milking, and sweetness and cleanliness in the utensils we use.

Should any cow be sick, her milk should never be mixed with that of the rest of the herd. If she be suffering from "garget" her milk partakes of her own temperament at the time, "feverish." Milking as we do at Oaklands from 125 to 150 Jerseys, we always have a stable to which we remove any sick cow, and never allow the milk from this stable to be mixed with the rest. I have known the milk of one sick cow taint that of thirty others when mixed with it.

You doubtless all have had far more experience in feeding than I have, and I will only briefly touch on one sort of food, "ensilage." We have now had three years experience in feeding ensilage. I think I am correct in saying that we in our Oaklands Jersey Dairy at Toronto and Hamilton obtain a higher price for our Jersey milk, cream and butter than any dairy or maker in Canada, namely, ten cents per quart for milk, fifty cents per quart for cream, and forty-five cents a pound for our butter, and yet these products are from cows fed ensilage. When the public pay a price largely in excess of the current market one they are naturally very ready to find fault should the articles supplied to them be faulty in any respect. That the demand upon our business is largely in excess of our ability to supply it is the best evidence that the milk from ensilage fed cows is not injuriously affected by this feed.

To support our 250 head of Jerseys in winter we would require at least two tons of hay a day did we not use ensilage. On twenty-five acres we last year grew sufficient ensilage to feed our entire stock from one-half to one bushel a day from the fall to the spring, supplemented by about eight to ten tons of hay a month, a few roots and ten tons of bran and shorts mixed per month. After a three years' trial I am convinced that ensilage is the most economical feed possible to be produced and that it leaves no taint in the milk if properly cured and pitted. Properly cured corn-stalks, too, is a fodder far too much neglected by our dairymen; and in summer green corn fodder will in times of drought prove most advantageous.

Those of us who are carrying on winter dairying will find a most marked improvement in the quantity of milk by heating the water the cows drink, in place of allowing them to partake of cold water at freezing temperature.

Who that has gone into the cow stables of many of our farmers sending cream to factories and butter to market, has not noticed the strong "urinal" and "manurial" smells that greet them at the door? Good milk, absolutely clean and pure, cannot be produced in dirty stables. They must be properly ventilated. Unless cows take into their lungs pure air they cannot produce pure milk. If your stables are built tight, do not be afraid to give your cows plenty of ventilation by means of ventilators running up to and out of the roof Fresh air should come in at the head of the cows, and pass off at the rear. Clean out your stables at least daily and use muck, saw-dust or other absorbents to take up the urine. It conduces to cleanliness and increases that best of all banks the manure pile. To those who can afford it, and it will pay well in the long

run to use it, I would advise that a solution of one pail of common commercial sulphuric acid to sixty pails of water should be used in the manure gutter in rear of the cows. It will keep down all urinal smells.

We should all curry our cows daily. It conduces to the health of the cow, and the cleanliness of the milk. The milker invariably places his head against the cow when he milks, and if there be any dirt on the body it often finds its way to the milk pail. All milkers should wash their hands before milking, and sponge the udder of the cow. Many think that straining will take all the dirt out of the milk. It should never have got in, but do not forget that many particles find their way into the milk from the udder and body which dissolve and no straining will take it out. Milkers should not dip their fingers in the milk. Two "dry milkers" are more valuable than three "wet milkers."

All the care in the world with our cows, our stables; our feed and water, and our person count for nought unless the cans and utensils be absolutely sweet and clean. All cans and utensils should be immediately washed and scalded when done with; rinsed in cold water and placed in the open air, bottom up. Select a spot free as possible from dust and absolutely free from foul odours. When wiping the cans, etc., see that the cloth is free from grease. At Oaklands we do not allow the use of soap in our dairy or washing-room, but use washing soda. It cuts the grease and is much cleaner than soap.

Assuming that we have drawn the milk from cows in good health and clean, fed wholesome food, given pure water, with hands that are clean and using clean utensils, our vigilance must not stop here. When the milk is drawn from a cow, immediately after weighing it and entering it in a permanent record, we take it from the stable in order that it may not absorb any injurious odours. In the early winter mornings, before the doors are opened and the stables cleaned out (although we practice what I have herein preached) we have found that unless we adopt this practice, we have at times trouble with our milk. We then strain that which is to be shipped to Toronto as milk into larger cans through three thicknesses of "butter cloth," and then pass it over a McPherson cooler to purify it and at once reduce the temperature, and immediately submerge it in cold ice water. That which is to be put through the centrifugal separator is strained into a large vat through an equal number of thicknesses of "butter cloth."

We have great faith in aerating milk at once after it is drawn from the cows udder, as not only greatly improving the keeping quality of both the milk and cream therefrom, but also improving the quality of the butter made from the latter. Mr. McPherson of Lancaster has invented a very simple and inexpensive but withal a very effective milk aerator which we have found accomplish its objects most admirably, reducing the milk while passing over the surface from 25 to 35 degrees.

I assume that there are present those who not only produce milk from which to make butter, but those who sell cream for consumption as such, as well as those who ship milk to the city to be used as such. The mode of treatment of the milk and cream depends upon the objects for which we intend to utilize them. If to be shipped to the cities as whole milk, morning and night's milk ought never to be mixed together for this purpose, but the quicker the milk is reduced to a very cold temperature the greater can we ensure the keeping qualities. The colder the milk (if not frozen) the longer will it keep when exposed to the common air.

In cooling the milk remove the tops off the cans. It must be borne in mind that the air of the room in which the milk is "cooled" must be sweet and clean. It is claimed that while the milk is warmer than the surrounding air it gives forth any impure odours it may be possessed of; but that when the milk is cooler than the surrounding air the former partakes of any impurities centained in it. Hence the absolute necessity of having the air of the room pure.

Friend Browning will entertain you on the subject of the "best mode of cooling milk for raising cream," and in not touching on this portion of the subject I feel I leave it in better and more experienced hands. Perhaps he will permit me to say, from a long experience in testing individual cows for butter, that milk left in the Cooley creamer for 36 hours will produce more butter than if left for 24 hours, and if it remains for 48 more than if left for 36 hours. I refer to quantity, not quality.

Mr. Sprague has the centrifugal system in his hands, and it could not have been entrusted to a more competent exponent, but I trust he will not think me "poaching" on his premises if I refer to one point especially bearing upon the shipping of cream to towns and cities. We have found at Oaklands that when we allowed our milk to become cold in winter, before running it through the Centrifugal we had to heat it up again, to extract all the cream from it. This we do by passing the milk over a heated surface of corrugated tin slanting downwards, (heated with steam) before the milk goes into the separator. The heating of the milk destroys the keeping quality of the cream, unless it be immediately cooled down to a low temperature; to overcome this difficulty we have had a tin constructed eight feet in length and about six inches in width, with tin sides. It is hollow, and we fill it with broken ice. The surface has little steps to check the cream from running too rapidly over it. As the cream comes from the Centrifugal it passes over this surface and thence into the cream pail at the other end of the long tin cooler, thereby reducing its temperature 30 degrees in less than a minute. I would also add that we analyze our cream and milk at our Toronto dairy daily to ascertain the quantity of butter fat contained in each gallon of milk and cream, and that a gallon of cream from the Centrifugal Separator when running at full speed produces a much greater excess of butter than that from a Cooley Creamer. This alone shows the necessity of paying for the cream by the butter it contains, and not by measure or weight of the cream itself.

From the *Rural World* I take a set of Rules adopted by one of the most successful co-operative creameries in New England:

CREAMERY RULES.

1. Patrons must not feed any cotton seed, linseed or gluten meal turnips, onions, cabbages, or anything else tending to injure the quality or flavour of the cream or butter. Middlings are not considered as good feed as shorts, which, with corn, rye or oats are recommended.

2. Cream tanks must be kept thoroughly sweet and clean, and the water changed at once whenever the cream gatherers may so direct. Cans must be thoroughly washed and scalded every time they are used. Rinsing out with cold water will not answer at all.

3. In the setting of milk, all cans must be filled full of fresh milk alone, so far as possible. If the amount of milking is not sufficient to fill an even number of cans, then pure, fresh water may be used, but no ice water, or water which has had ice in it, or any ice must ever be put into a can for any purpose whatever.

4. Cans must not be partly filled at one milking, and after standing long enough for the cream to begin to separate, be filled up with milk from another milking, or with anything whatever. After a can has once been set, it must not in any way be disturbed or meddled with, nor the milk be drawn off by the patrons, except on Sunday, and all patrons and cream gatherers shall, at all times, use the tubes to draw the milk with.

5. Cream gatherers are forbidden to take any cream which is dirty, or which for any reason in their judgment, is not of satisfactory quality or condition, or which has been in any way so treated as to indicate that an attempt has been made to interfere with the proper and natural separation of the cream, or of it being correctly counted on the gauge, or in violation of these rules.

6. Any patron found neglecting or violating any of these rules must at once be reported to some one of the board of directors, and his cream must not again be taken till he shall have satisfied the directors that his neglect was for good reasons excusable; and if any patron shall be more than once so reported, it shall be deemed a sufficient reason for a refusal to again receive his cream at all. Cream gatherers are especially directed to take all possible pains to discover all violation or neglect of any of these rules, and to strictly enforce them in every case.

7. These rules and instructions are found by experience and observation to be necessary for the protection of the association and the best good of all its members. Copies thereof will be securely posted conveniently near each cream tank, so that ignorance can be no excuse for neglect. Patrons are requested to notify the board of directors if any cream gatherer is in any case delinquent or careless in his observance of these instructions. Patrons who are not disposed to be governed by these rules are requested to so advise the directors, and the treasurer will make prompt settlement with any who wish to withdraw.

In conclusion permit me to point out the absolute necessity of system and order in all things in and about our cows, our stables and our dairy. There is a place for everything, and if we wish to save time and keep our patience, we in turn must put everything in its proper place. The cows, too, demand this at our hands. Milk them and feed them at the regular time each day. In milking begin at the same cow, and then on to the next in turn, and so the end. Approach her with kind words and gentle pats,

and she will then learn to look for your coming with kindness beaming in her eye. She will know you to be her friend, who stays the craving of her appetite or relieves her over-burdened udder of its pure luscious milk, and she will reward you to the full extent of her capabilities. If, on the contrary, your approach is heralded by abuse and threats, meagre may be your measure of milk, restless God's creature given to administer to your wants and supply you with an all sustaining food, and should she succeed in landing you and your milk-pail on the floor in rear of her, she will have measured you out nothing but your dues.

ADVICE TO BUTTER-MAKERS.

Prof. Robertson then read the following paper by Mr. McHardy, butter-maker at the Experimental Farm:

Cleanliness is the most important item in butter-making. Let cleanliness be observed by all patrons and let them bear in mind that the reputation of the factory is at stake. If a pure, clear and wholesome article be sent to the factory it will not only take a great deal of anxiety from the maker's mind but be a credit to the patron and factory as well. Where cream only is collected the cans best adapted for use by patrons of a creamery are the deep setting milk cans. There are some six or seven different styles of them, but as to the respective merits of these I am not prepared to say.

Let cleanliness be observed about the cow stable. See that it is kept so that no foul odours shall be absorbed by the new milk and that the animal may be healthy so as to give pure wholesome milk. The milk should be set as soon as possible after milking. Each patron should provide himself with a tank suitable for the number of cows he keeps. The surroundings should be free from all bad odours, perfect cleanliness being observed in the care of the cans and tank. The milk should be strained carefully through a linen cloth strainer into the milk-setting vessels. It should now be placed into the tank with water and ice and cooled to a temperature of 40°, as the change of temperature gives the best results in separating the cream. The milk should be skimmed by the patrons every twelve hours.

The cream after skimming should be placed in a can and submerged in water at a temperature of 40°. The cream should be collected and brought to the creamery every alternate day.

The teamsters employed collecting the cream should be reliable and honest men, taking care that their cans and waggons are clean. They should show no favours to patrons, using all alike, rejecting all impure cream, warning the patrons of their neglect and also reporting the same to the manager when the cream arrives at the factory, which should not be later than 5 p.m.

Each factory should be provided with vats fitted with conveniences for the cooling and warming of the cream.

The following points are important: (1) Never keep in separate vats the cream that is being gathered for a single churning. (2) Always put the cream of a whole churning in a single vat; the failure to do this will result in a loss of a portion of the butter obtained.

After the cream is put in the vat it should be well stirred and allowed to become equally ripened. The butter-maker should note the temperature and condition of his cream and be guided accordingly. If the cream arrives at the factory sweet, the maker should heat it sufficiently, say to a temperature of 65°, allowing it to cool gradually. If it should arrive in a sour condition, the temperature should be lowered to say, 45°. The average temperature of churning may be said to be 60°, and the range of temperature from 55° to 65°. The lower the temperature within this range the better for quantity.

The churn must be well rinsed with cold water before putting in the cream. Start the churn slowly at the beginning and increase gradually until the ordinary motion has been attained. The churning should now be proceeded with until the butter has reached a granular state, which should not take less than 35 minutes or longer than 60. The temperature is now lowered to about 55°. This may be done by putting in cold water.

Then set the churn in motion again. Care must be taken not to stop it too soon, or to advance the operation too far. As soon as all the butter has come, and is gathered enough to make it possible to draw off the buttermilk without carrying the butter with it, the churn should be stopped. At this stage the particles of butter are smaller than the size of wheat grains.

The churning now being stopped, while the butter is yet in fine grains, the buttermilk should be drawn off and the butter washed in its firm granular state, first with cold water at a temperature of 55°. If it is washed with water at a lower temperature an apparent skin will be formed over the small particles and lock the buttermilk in.

Avoid sudden changes of temperature. The plan I follow after drawing off the buttermilk is to run the same amount of water in the churn as I take away of buttermilk. The temperature of water for first washing is 55°. I now give the churn six or eight quick revolutions, draw off the water and repeat the process again ; the only change made is in the temperature of the water, it being now 50°. If the butter is free from milk it is sufficiciently washed ; if not repeat the latter process.

Churns with stationary bodies are not so well adapted for the process. I have used four different kinds of churns and prefer the square box one, which is best adapted for the above process.

After the water is drawn from the butter in the churn I remove it to tubs for that purpose and weigh it carefully. I then work it very carefully, adding at the same time three-quarters of an ounce of salt to the pound, taking every precaution not to injure the grain in any one way. It is best not to let the hands come into contact with the butter.

I next put the butter in tubs and place it in a cellar or cold storage-room, as the case may be, at a temperature of 58°, letting it stand till the salt dissolves, which will generally take from seven to eighteen hours, depending on the kind of salt used. I then re-work it, taking care not to work it too much, after which it is ready for packing.

It is important that the butter is pressed in the tubs very firmly. Be sure to pack it close ; fill the tubs within three-quarters of an inch of the tops ; place a clean muslin cloth, well soaked in brine, over the top, tucking down the cloth between the butter and the tub ; make a plaster of fine salt and water and place it on the top of the cloth ; put on the lid, tin up, and it is ready for the market.

THE SANITARY ASPECT OF DAIRYING.

Dr. Bryce, Secretary of the Provincial Board of Health, next addressed the Convention on the sanitary aspect of dairying. He said :

I have to thank you for the kind invitation extended to me through your President, to address a few remarks to you regarding the important sanitary questions which are intimately associated with the work of creameries and dairies. It gives me especial pleasure to be present with you, not only because I believe that such associations as this will prove to be most powerful agencies in the advance of sanitary knowledge and the progress of local municipal health work, but also, because it recalls to me the pleasant associations and duties of former years, when my work at the Agricultural College was an integral part of the practical work which you are met to-day to discuss.

It has not been more from the fact that the whole question of food supplies, as meat, milk, fruits, etc., forms a special part of sanitary work and supervision, than from the many complaints, which during several years past, have been brought before the authorities of the Provincial Board of Health, regarding nuisances arising from cheese-factories and creameries, due to the disposal of the refuse whey products, and the feeding of large numbers of hogs with it in neighbourhoods contiguous to travelled roads and towns and villages, that our attention as a Board has been so largely given to the subject.

Hitherto the fact has not been known, or not sufficiently appreciated, that the quality of the products of the dairy, is in a remarkable degree, dependent upon the purity of the atmosphere surrounding, and the cleanliness within and about the factory ; and, as a consequence of this, crude and supposedly economical methods were adopted both in

their constitution and management. Now, from what I have heard in the discussions this morning, and from the recommendations adopted last year by the Western Dairymen's Association, I think it may be said that the commercial value of cleanliness in its widest meaning is being quite as keenly appreciated by the dairymen, as its sanitary aspects are by local and other Boards of Health. Indeed, the fact that its practice and consideration become a duty of everyday business, makes it perfectly certain that in proportion as the high character of Canadian dairy products is maintained and advanced, so will the requirements of the law in regard to their conduct be complied with. Such associations may therefore very justly be considered as branch sanitary associations, whose interests are bound up in, and a part of, those of the Provincial Board of Health. In the past reports of the Provincial Board, but especially in that for 1886, (copies of which I shall be happy to forward to any gentleman asking for them), the practical and scientific aspects of the question of nuisances arising in connection with such have been fully dealt with. In the section of this years' report dealing with the "Decomposition of Albuminoid Matters," what I might say now did time permit, has been treated at length, and the dangers resulting to health from impure food of various kinds, have been illustrated by the well-known facts regarding the bacterial origin of putrefaction, and of how the *microbes* of specific diseases of both men and animals may be both transmitted and cultivated in milk, meat, etc. But I am aware that you are all anxiously expecting to hear Prof. Robertson deal with the question of points to be considered in butter-making, and shall not therefore enter further into this important question, but shall conclude by thanking you for your kind attention; and shall carry away with me the assurance that the Provincial Board of Health has in all these associations, dealing with the industries connected with national food supplies—matters of paramount importance—friendly allies and co-workers toward a common end, the public good.

The convention assembled at 2 p.m., Mr. Hannah in the chair, when Prof. Robertson delivered an address.

LITTLE MATTERS IN PRACTICE WHICH ENTAIL GREAT LOSSES.

Prof. Robertson.—There is too much attention paid by dairymen to the matter of forcing up the market in which they dispose of their butter. Now, it is desirable to try and reach the best market at the best time with the butter in the best possible condition, and there is much advantage to every dairyman in coming into direct contact with the market that ultimately regulates the price. If the dairyman sells the butter to the shopkeeper and does not come into direct contact with the ultimate market, he is not stimulated by the extra price which it brings, if good, to improve the quality of his production, or warned by the low price it brings if it is of inferior quality. Two markets are watched carefully by all dealers in dairy products. The one is the market to which the dealer sends to buy his goods, and the other is the market in which he finds it pays best to sells his goods. The margin between these two points is the dealer's allowance for expenses and profit. He has no more allowance than that. It is the endeavour of every successful business man to make that margin as long and as wide as possible. The prime cost and subsequent expenses ought always to be less than the selling price. So you have three considerations to watch in mercantile and manufacturing transactions: the cost of production; the expenses incidental to marketing and transfer; and the probable price to be realized. Every business man will tell you that the most important point is to get good value to begin with. Go out through the country and you find this point recognized fully. The shopkeeper will tell you: "If my goods are bought right I can sell them right." Dairymen, as producers, have precisely the same conditions to observe for profit, as the dealers have. These are watching to have the cost of production and possession lower than the price that can be realized. All through this country there has been too much endeavour to force up the selling price, and too little attention to lessening the cost of production. We cannot regulate the price of butter in England, or in Canada, but what we need to do is to lower the cost of producing butter in our own

country, to put it away down and so lengthen the line of profit. The price of butter is not uniform, and in Canada it runs from ten to twenty-five cents per pound; in England all the way from fifty-two shillings to 142 shillings. Every individual can perhaps force the market up for himself by getting the best obtainable price, by making the best possible quality of butter. I will not undertake to describe the kind of butter necessary. You all know as much about this as I do, being practical butter-makers. I would just point out some little defects that exist in our butter, the remedying of which would make the butter perfect, and the best made in any country, because we have the climate conditions and the soil and other natural advantages, which will enable Canada to make butter better than any country in the world (applause), both for present flavour and for keeping qualities after it is six months old. In passing, let me say that there is unlimited demand for first-class butter. There is no possibility of glutting the market with goods of the finest quality. The inferior butters are put really out of the markets by the plenitude of cheap imitations; but imitations have no effect whatever on the price of the fine article. Poor and medium qualities have suffered, and I hope that this will make the farmers endeavour to produce butter which cannot suffer from imitations. In that way I call even substitutes for butter a blessing and a benefit to dairymen. All our losses should be educational factors to make us wiser and better. Substitutes for butter that are sold under their own name may be a good food for poor people, but imitation butter that is palmed off as butter interferes with the dairymen's profits, and is a fraud which should not be tolerated. There is an unlimited demand for fine goods at remunerative prices.

In the endeavour to meet the market with these finest goods the first little matter I find that causes great loss is, the selection of an unsuitable package. I am going to speak first of these little matters outside of butter-making that make great losses, then of those little matters in the butter that make great losses; then, lastly, those little matters in producing the cream and butter that entail great losses. The first thing then is the matter of selecting suitable packages. We have not used any kind of wholly suitable packages in the past. They are not attractive in appearance to begin with, not by any means ornamental when they reach the consumer's shop. We should have a package that is attractive on the outside, as well as equal to keeping the butter well on the inside. To accomplish this we must have the butter package bagged for shipment to protect its outside surface and keep it clean and neat looking. The first impressions which a buyer forms are worth a great deal to the seller. If a buyer's first impressions are favourable, and he sees the butter done up in clean and neat-looking packages, he will begin looking for good qualities and fine points in the butter. If the first impressions are otherwise and the packages are not attractive or clean-looking, almost unconsciously the buyer begins looking for defects in the butter. Every dairyman should have his butter so that the first impression of the buyer will be, "That butter looks well." The packages should be made strong so as to stand the rough handling and rough usage incidental to shipment. The packages have been insufficient in weakness of material, and the covers have not been made to fit properly. This is not true of all our packages, but of most of those that our butter has gone in. Covers have been left loose, hoops have been broken, and the butter has been exposed to all the foul air and smell of the ship's hold, or of the dock on the other side. Butter is seriously injured from this cause. Just a few words in regard to the kind of package to hold butter to get the highest possible price. I have found amongst the packages sent over to England a good many tin-lined tubs, white ash tubs, oak tubs and spruce tubs. I have found them stand in this order of preference: Round tin-lined tubs first, for leaving the butter without any sided taste; white ash tubs next; oak tubs next and spruce tubs last. The butter in some of the spruce tubs was as excellent as any I had seen, but after keeping it in the humid air of England for two months the spruce tubs seemed to have imparted an imperfect and undesirable flavour to that portion of the butter near the sides. The tin-lined package has a good appearance on the outside. It has not a soaked appearance. The average of buyers in London, and in the east and west of England and south of Scotland, have a preference for butter in tin-lined tubs. There is one objection to tin-lined tubs, and that is, that when the butter is turned out of them it sticks to the sides in places, and the whole has a jagged and uninviting appearance. That is a decided objection, because the butter loses in attractive appearance. But this can be remedied by butter-makers lining the in-

side of even tin-lined tubs with a thin cloth, which does not cost more than four cents per tub. The butter would then come out of the tub clear from the sides. A butter-maker could very well afford to put four cents extra on each tub that way if he can get a half cent a pound more for his butter. Another package for which I found a good deal of call was the oak firkin and the white ash firkin. The oak firkin made with iron hoops is not desirable. The iron hoops are apt to rust and give the outside of the firkin a streaky appearance. But oak or ash staves and hoops will find favour all over England. The Danes have sent their best butter in this kind of a package. I would make a package of this kind and call it the "Canadian Cask." So far I would stoop to the prejudices of any market. The English and Scotch buyers will pay a longer price for butter in that package, for the reason that the prejudice is so strong against American butter that the storekeepers don't like to keep our tubs. A storekeeper will tell you, "We won't have a tub of this kind in our shop, because our customers will think we keep American bosh butter. Therefore, we will have only the Danish, Swedish or French shaped package." It is a package that will preserve the butter and will get the highest price. The casks should hold 112 pounds.

The size of the packages has hitherto been unsatisfactory because they have not been uniform. A buyer does not like to have packages 51, 52, 53 or 60 pounds, because there is often quarrelling about weights. We want a larger package than we have been using, and butter will keep better and sell better in England.

The next little matter that I find entailing great loss upon butter-makers is carelessness in the preparation of the packages. I find men using tin-lined packages without washing, and the butter has a tinny taste. Or, sometimes, there are scratches on them producing rust. From this there will be a loss of five shillings a cwt. if detected. The man who does this not only suffers this loss but entails a subsequent loss upon himself; he loses his reputation. White ash, oak and spruce tubs have been used, and there is a great deal in the soaking of these packages. These woods have a bitter taste from the presence of certain acids. The tannic acid from the oak makes the butter "sided."

Another little matter is inadequate attention to the pressing of the butter in packing it into the tub. It is often put in carelessly and not pressed firmly down to have a solid body. It turns up weaker in the trial, and has an irregular surface when the tub is removed. The quality of the butter is rendered not so fine and its appearance less attractive. Butter should be so packed that the tub is quite filled to within half an inch of the lid, and packed so that the tub is filled closely throughout its whole capacity. In using the firkins that I have spoken of it would be better to have them headed in, than to have firkins with overlapping covers. I would not recommend dairy butter to be packed in firkins at all. There is no demand for low priced butter in that package. There is such a demand that the Hollanders put their butterine in these tubs to get a price for it.

Another small matter has been the using of unsuitable cloth. A cloth that is not chemically pure will impart some of its own taste to the butter. I find a great deal of it even when washed in salt and saltpetre to impart a very bad taste to the butter. Another matter to be considered in packing the tub quite full is that when this is not done the salt plaster may get shaken to one side leaving the butter exposed to the foul odours of the ship. Canadian creamery men should guard against this. The tub should be so full that the lid will touch the salt plaster and it will be impossible for it to slip to one side.

Mr. CHEESMAN.—Where can you get this chemically pure cloth?

Prof. ROBERTSON.—I have some letters here from the firm of David Hess & Son, who claim to supply cloth to the best dairies in England, Scotland and Denmark, and have certificates from the best chemists as to the purity of their cloth. I have a box coming over containing some twenty samples, which I will send to any of you who may wish. Another matter that entails great loss is in the neglect of frequent brining of the butter after it is packed. If the top of the butter is covered with the salt and allowed to become dry, the salt has such an affinity for moisture, that it may absorb the moisture from the butter. In this way it takes out some of the volatile oils which give

the butter its sweet, nutty flavour. You cannot pay too much attention to the frequent brining of the butter.

Another small matter that entails great loss is failing to provide suitable storage for the butter. The first loss is from the effect on the outside of the tubs. It makes them damp and dirty looking. In going around to the creameries last year I did not find one which had suitable storage. None of them had an ice-cooling process to lower the temperature. At the college we had the cellars. If it had not been for them we would not have had any adequate means of keeping it cool enough for preservation. There is great injury to butter in allowing it to become too warm. There has been a mistaken idea that if butter is chilled after it is made it will not keep very long when exported to a warmer climate. The Danes, last year, undertook to send some butter to England in refrigerators. That butter was sent to dealers in different parts of England with butter which had not been so treated. The dealers were not let into the secret, but the result was that the butter which had been kept cool brought four shillings per cwt. more than the other. Butter that is kept just above freezing point will have its quality preserved better than that which is not, and will keep better afterwards. It has been suggested that the producer should ship his butter immediately, and then he would not need storage. But there are two difficulties that stare him in the face. There is, first, the difficulty of shipping safely; secondly, of getting suitable transit accommodation. But when it comes to shipping June butter in the middle of July, under the present conditions of accommodation, the butter would soak right through the tub. It is possible to have better shipping conveniences and I believe we will yet have them. But would it pay the producer to sell June butter when the climate is worst and the prices lowest? Would it pay us as dairymen? No creamery is every helped in profit by holding back June butter in a common cellar. The quality of the butter will deteriorate more than the price will improve, and June butter, in June, is worth more than June butter in December that has been improperly stored. But June butter is not consumed in England till December. Somebody has to hold it from June till December. It is not for me to say who shall hold it. That is for commerce and yourselves to decide. But people who have the butter to produce should see to it that, wherever it is held, it shall be held in the best possible condition, because if it is held, either by an Englishman or a Canadian, in an unsuitable condition, it is spoiled, and the producer suffers by the bad reputation it brings. Therefore, the man who makes the butter should use his influence to go into the thing commercially—to the extent of providing suitable storage. This association should do something in the way of providing suitable storage accommodation. If this association would undertake this matter or lend its influence to the matter, butter can be stored with profit to the storage company at five cents per month per tub; leaving a profit on the capital invested and paying the wages of the caretaker. We could thus put our butter on the English market in the best condition. It is a fact that this cause has cost Canada fully twenty-five per cent. of her profits and receipts from butter during the last twenty-five years. I found in Edinburgh that the butter we made in May was held as late as December, and it was worth three cents per pound less than if it had been well stored at Guelph.

There are some small matters in regard to the cream and the butter which entail great loss. The first is in allowing the cream to be sour for too long a time. It should not be sour for more than twenty-four hours. Longer induces a bitterness that destroys the fine butter flavour. The next small matter is in souring the cream by exposing it to impure air. A great many sour the cream by leaving it exposed to foul odours in the barn-yard or in the creamery from the gutters being in a filthy state. This entails great loss and inflicts great injury in the quality of the butter. Another small matter is the keeping the cream at too high a temperature. You can make it sour by keeping it too warm. This inflicts loss by causing injury to the quality of the cream. I have spoken of these for the reason that the best butter is made from the sour cream. There is sweet cream butter and sour cream butter, and each has those who prefer it. But the Danish butter that fetches the very top prices in London, Manchester and Copenhagen, for export to hot climates such as India, China, and the West Indies, has to be made from sour cream. How can it be best soured? The Danes instead of keeping it very warm add to it

while still sweet a small proportion of cream that is made sour by exposure to air and then kept at a temperatue of 70°. I will take five minutes to explain this. Sourness in milk is caused in this way: The sugar of the milk is changed into lactic acid, but that change does not originate itself. The air is full of germs and spores. To explain how they act let us cite the operation of yeast in bread-making. When you put in the yeast you put in germs of little plants, and when fermentation starts it is by the little plants beginning to grow and the giving off carbonic acid gas. It is this gas escaping that causes the little holes and bubbles. If the temperature is low the growth is checked and the fermentation does not go on. There must be just a suitable temperature. You may say "how can they grow so quickly?" But if you take the oak which, say, takes a thousand years to reach maturity; and then take the mushroom which will grow in a night, and then imagine a germ as much smaller than a mushroom as a mushroom is smaller than an oak, you can understand that the little germ may grow as much more quickly in proportion to the mushroom as the mushroom does to the oak, the germ being as different in character from the mushroom as the mushroom is from the oak. And you may expect to see these germs grow in an hour. Milk will not sour unless these spores are absorbed from the air. Scalded milk will not sour readily, because the spores are destroyed. The idea is to get these spores into the cream. If a creamery man sours a small portion of his cream to make the "fermentation starter," he will get a better yeast than if he exposes the whole to impure air. That latter kind of fermentation gives a different kind of flavour. The former will make more butter and bring more money, and the butter will have better keeping qualities. The full value of having your cream sour, not by exposing the whole cream to the action of the air but by having a little cream to sour it all, has not been realized. The proper percentage of it to add is about two per cent. If you have a small quantity kept at 70° for twenty-four hours and add it to your cream in the proportion of two per cent., you will have a better butter than you can get by any other process of souring. I have experimented in cheese-making by old sour whey, and some of you are acquainted with the process of beer-making. I found one place in North Germany where a butter-maker got his fermentation starter from his buttermilk, but that man's butter had not a desirable flavour. Another small matter which causes loss, is churning the cream at too high a temperature and churning too long. If the cream be churned too long there is a loss. Just a word as to what churning is and what it is for. The fat of the milk is all in the form of small globules. The churning is to drive these together, not to break their skins by friction or any other way, but simply to drive them into each other. Souring the cream will make churning easier, not because it changes the fat but because it changes the medium in which the fat globules are held. When you have the cream sour the globules come together easier, because the circulating, containing and separating medium is not so likely to keep them apart. The proper temperature at which to churn varies with the length of time that the cows have been calved. If you churn at the same temperature with milk of cows that have lately calved, as you do with the milk of cows that have been milking some months, you will not get the same results. Suppose I take two bottles and put into one some grains of tallow which I have made into little grains like shot, and put into the other some little grains of lard of the same size. I place them at a temperature of 50° and then by shaking they do not come together; if I raise the temperature they are more likely to do so and the lard grains come together more readily than those of tallow and at a lower temperature. In the milk of cows which have been calved a long time the fat globules are harder than those in the milk of cows lately calved. From experiments which have been made it has been estimated that the percentage of the constituents of the fat in the milk of new calved cows is as follows: Twenty per cent. of palmatine, 50 per cent of oleine, and 30 per cent. of margarine; after six months the percentage stands 20 per cent. of palmatine, 30 per cent. of oleine, and 50 per cent. of margarine. You had before 50 per cent. of the softer and only 30 per cent. of the harder fat; now you have 30 per cent. of the softer and 50 per cent. of the harder. The temperature of the churning should therefore be regulated by the condition of the fats which in turn depends on the length of time after calving. In the spring a lower temperature will answer, while later on it should be higher.

Mr. SPRAGUE.—58° to 62°?

Prof. ROBERTSON.—I would say 57° to 62°. Another small matter that entails great loss is cooling the butter too suddenly in the churn. If the butter-fat be cooled too quickly in the granular state the butter-milk is not taken out of it and the butter suffers injury.

Another small matter is washing the granular butter with water either higher or lower than 55°. The temperature has more effect on the grain of the butter than the working. The best temperature then is 55° in the summer time. I will give you a few points now in regard to the treatment of salt. Injury is done by using an incorrect quantity of salt; and by using unsuitable and impure salt. The few points which I would give you are: It should be pure and free from any foreign substance, uniformly fine in the size of the grains and should have some weight imparting value. It should be velvety to the touch. I will not say anything about the different values of the various brands—you have appointed three men to come to Guelph to inspect the butter samples which we have prepared with the different kinds of salt. We have 45 tubs prepared with different kinds of salt and salted all the way from one-half an ounce to an ounce per pound. The report of these gentlemen will be duly presented to you and will satisfy you on these heads. We want salt that will dissolve easily more than anything else, because hard salt will make the butter oily in appearance from injury to the butter grain in re-working. Another loss is entailed by delaying the second working too long. If butter be overworked it is made oily and greasy looking. All of these things determine the selling price of butter. I would say a word in regard to the small matters that affect the cost of production. First there is the late calving of cows; cows should give milk for ten months. There are profitable methods of raising calves and I have pointed them out in my report to the Commissioner of Agriculture. Creamery men should not allow themselves to be ignorant on these subjects. Farmers should not fail to provide supplementary feed in the summer time. Another loss is caused by farmers forgetting to put up ice for summer use. Sometimes a lot of the cream is left in the milk. Fully half-a-pound of butter in every 100 lbs. of milk is lost from this cause. Sometimes cream is churned when it is not properly ripened. I have called these little matters but in reality they are great matters and are only little in the sense of having been considered so. If you look after them you'll have a great amount of profit; if you do not you will have great losses.

The further little matters of failing to attend such conventions—of failing to observe, to read, to think, to learn, to improve—are inflicting immense losses on such dairymen.

AUDITORS' REPORT.

To the President, Officers and Members of the Ontario Creamery Association:

GENTLEMEN,—We, the auditors, beg respectfully to report that we have examined the books of the reasurer and hereby certify that we find the accounts correct.

Receipts.		*Expenditure.*	
Donation, V. E. Fuller	$ 50 00	Expenses of Directors' Meetings	$221 75
Members' Fees	51 00	Essays	29 40
Government Grant	500 00	Lectures	60 15
		Advertising	50 35
		Hall for Convention	22 00
		Salary, Secretary and Treasurer	25 00
		Postage and Stationery	16 68
		Balance on hand	175 67
	$601 00		$601 00

P. A. CARPENTER, } *Auditors.*
JAS. E. BAILLIE, }

Toronto, February 25th, 1887.

On motion the report was adopted and the convention adjourned.

APPENDIX.

AGRICULTURE AND ARTS ACT.

[*From Chapter* 11, *Ontario Statutes of* 1886.

65.—(1) The Associations now existing, and known as "The Ontario Fruit Growers' Association of Ontario," "The Entomological Society of Ontario," "The Dairymen's Association of Eastern Ontario," "The Dairymen's Association of Western Ontario," and "The Poultry Association of Ontario," shall each continue to be a body corporate, to comprise not less than fifty members, and may each make by-laws and regulations for the Association's guidance and proper management, not being contrary to the provisions of this Act or the general laws of the Province. R. S. O. 1877, c. 35, ss. 89, 94, 98; 42 V. c. 11, ss. 1-5.

66. Each of such Associations, so long as the number of its *bona fide* members is not less than fifty (each paying an annual subscription of not less than $1), and so long as it complies with the provisions of this Act, shall be entitled to receive from unappropriated moneys in the hands of the Treasurer of the Province a specified sum to be placed in the estimates and voted by the Legislature for each year; provided that the Secretary of each of the said Associations shall, on or before the 1st day of September in each year, transmit to the Commissioner of Agriculture an affidavit, which may be sworn to before any Justice of the Peace, stating the number of members who have paid their subscriptions for the current year, and the total amount of such subscriptions. R. S. O. 1877, c. 35, ss. 90, 95, 99; 42 V. c. 11, s. 10.

67.—(1) Each of such Associations shall hold an annual meeting, at such time and place as may be determined upon; and each Association shall at such annual meeting elect a President and a Vice-President, and shall also elect one Director from each of the Agricultural Divisions included in such Association's limits; and the officers and Directors so elected shall appoint from among themselves, or otherwise, a Secretary and a Treasurer (or a Secretary-Treasurer); and each Association shall elect two Auditors. The Dairymen's Associations of Eastern and Western Ontario may each elect two Vice-Presidents. R. S. O. 1877, c. 35, ss. 91, 96, 101; 45 V. c. 11, s. 7.

(2) The officers shall have full power to act for and on behalf of the Association, and all grants of money and other funds of the Association shall be received and expended under their direction, subject, nevertheless, to the by-laws and regulations of the Association. R. S. O. 1877, c. 35, s. 92.

68. At each annual meeting the retiring officers shall present a full report of their proceedings, and of the proceedings of the Association, and a detailed statement of its receipts and expenditure for the previous year, duly audited by the Auditors; and a copy of said report, a statement of receipts and expenditure, and a list of officers elected, and also such general information on matters of special interest to each Association that such Association may have been able to obtain, shall be sent to the Commissioner within forty days after the holding of such annual meeting. R. S. O. 1877, c. 35, ss. 91, 96, 102; 42 V. c. 11, s. 8.

69. The Dairymen's Association of Eastern Ontario, The Dairymen's Association of Western Ontario and the Poultry Association of Ontario, shall each hold an annual exhibition, at such time and place as each of the said Associations shall at its annual meeting appoint, or may hold its exhibition in conjunction with any other Agricultural Association, whether such other Association is incorporated or organized under this Act or otherwise. R. S. O. 1877, c. 35, s. 103; 42 V. c. 11, s. 6.

77. The Treasurer of every Electoral District Society or other Association organized under this Act, before entering upon the duties of his office, shall give such security, either by joint or several covenant with one or more sureties which may be in the form given in schedule F to this Act or otherwise, as the Board of Directors or other managing officers may deem necessary for the faithful performance of his duties, and especially for duly accounting for and paying over all moneys which may come into his hands; and it shall be the duty of every such Board in each and every year to inquire into the sufficiency of the security given by such Treasurer and report thereon; and where the same Treasurer for any Society is reappointed from year to year, his reappointment shall not be considered as a new term of office, but as a continuation of the former appointment, and any bond or security given to the Society for the faithful performance of his duties shall continue valid as against the parties thereto under such reappointment.

AN ACT TO PROTECT BUTTER AND CHEESE MANUFACTURERS.

[*Chapter* 159, *Revised Statutes of Ontario*, 1877.

Her Majesty, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows:

1. Whosoever knowingly and fraudulently sells, supplies, brings, or sends to be manufactured to any cheese or butter manufactory in this Province, any milk diluted with water or in any way adulterated, or milk from which any cream has been taken, or milk commonly known as "skimmed milk"; or whoever keeps back any part of the milk known as "strippings"; or whoever knowingly and fraudulently sells, sends, brings, or supplies milk to any cheese or butter manufactory milk that is tainted, or partly sour from want of proper care in keeping pails, strainers, or any vessel in which said milk is kept, clean and sweet, after being notified of such taint or carelessness, either verbally or in writing, shall for every offence forfeit and pay a sum of not less than one dollar, nor more than fifty dollars, in the discretion of the Justices before whom the case is heard.

2. Any butter or cheese manufacturer who knowingly and fraudulently uses, or directs any of his employees to use for his or their individual benefit, any cream from the milk brought to any cheese or butter manufactory without the consent of all the owners thereof, shall for every offence forfeit and pay a sum of not less than one dollar, nor more than fifty dollars, in the discretion of the Justice before whom the case is heard.

3. Any two or more Justices of the Peace having jurisdiction within the locality where the offence has been committed may hear and determine such complaint upon the oath of one or more credible witnesses, and shall have power in case the penalty and costs awarded by them are not forthwith paid, upon conviction, to levy the same by distress and sale of the goods and chattels of the offender by warrant under their hands and seals, or the hands and seals of any two of them; and the penalty, when recovered, shall be paid over by such Justices, one-half to the person complaining and one-half to the treasurer of the municipality, district, or place where the offence has been committed; and, in default of payment or sufficient distress the offender may, by warrant signed and sealed as aforesaid, be imprisoned in the common gaol for a period not less than one day, nor more than twenty days, at the discretion of such Justices, or any two of them, unless such penalty, costs and the charges of commitment are sooner paid.

4. No Justice or Justices having any pecuniary interest in any such cheese or butter manufactory, as aforesaid, shall hear or determine any such complaint.

5. Any party aggrieved by such fraudulent conduct as aforesaid may at his election sue the offender in any civil court of competent jurisdiction, and recover from him the amount of damages sustained, and levy the same with the costs, according to the ordinary practice of the court in which such suit is brought.